Center for Governmental Studies
Northern Illinois University

Evaluating the Forest Stewardship Program Through a National Survey of Participating Forest Land Owners

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Evaluating The Forest Stewardship Program

Through A National Survey Of Participating Forestland Owners

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Focus and Purpose of Report

This report presents the findings from a national survey of participants in the Forest Stewardship Program (FSP) of the USDA Forest Service. Launched in 1991, the FSP provides technical assistance through state forestry agencies to help landowners develop multi-purpose management plans for their non-industrial private forestland. Typically these plans identify the owners' objectives in managing their land and then recommend activities (e.g., planting trees, thinning), on a stand- or site-specific basis, to achieve each objective. By the end of Fiscal Year 1998 a total of almost 149,000 stewardship plans had been written nationwide.

From late July 1998 through early May 1999, the Public Opinion Laboratory of Northern Illinois University surveyed by telephone and mail a total of 1,238 forestland owners who participated in the FSP. The survey's main purpose was to gather information from a random sample of FSP's clients that would shed light on the program's effectiveness to date. The report's findings are presented by region (Pacific States, Mountain and Plains States, Southern, and Northern), as well as for the country as a whole.

Whom Is the Program Serving?

Across the four regions, from 57% to 73% of the surveyed current participants reported that they had never before received professional advice in managing their forest land. In other words, the survey found that the program's actual clientele consisted largely of persons who were very likely to benefit from its assistance.

Per region large majorities of the respondents were male (72% to 86%) and white (94% to 98%). Either almost no African Americans or Hispanics owned forestland during the 1990s, or there is a need for more vigorous outreach to persuade owners of those ethnic backgrounds to participate in the FSP.

Forest Stewardship Plans Are Being Implemented Appropriately.

Across the four regions, large majorities of all surveyed program participants—81% to 86%--reported that they were carrying out activities recommended in their FSP plans. When those owners who had not started a component of their plans (e.g., tree harvesting, protection of water quality) were asked to explain their inaction, very few of these respondents blamed it on poorly drafted FSP plans or inadequate follow-up technical assistance. And relatively few attributed it to lack of money. The most common explanation was "time"; either personally they lacked the time or their plan's timetable called for action at a later date.

In all regions also, majorities of 55% to 68% were implementing a multi-purpose approach to managing their land. As desired by the authors of the 1990 legislation that authorized the FSP,

these program participants were carrying out activities with more than one management purpose. That it, they were not maximizing just timber income or only recreational benefits. The most frequently reported combination of purposes was "growing/caring for trees" and "improving wildlife habitat." From 43% to 56% of all respondents per region said that they were applying one or more recommended practices for each of these two objectives.

The FS program stimulated participating owners to spend significant sums for plan implementation for which they would not be reimbursed (such as through cost-sharing). Averaging $1,827 to $3,616 per surveyed owner per region, these expenditures make the Forest Stewardship Program cost-effective by at least one important criterion. According to calculations by the report's authors, in all regions the average unreimbursed sum that owners spent per acre exceeded the average federal government cost per acre for developing the FSP plans.

Participation in the Stewardship Program Helps Owners to Change Ways that they Manage Their Forest Land.

The survey found evidence that participation in the FSP helps owners to change the ways that they manage their forestland. Across the four regions, from 52% to 56% of all the surveyed owners reported having begun to implement activities recommended in their plan that were *new* to them. Secondly, 21% to 44% of the many respondents who had not previously subscribed to periodicals about managing their forestland said that they currently did have such subscriptions (either printed or electronic). Thirdly, among the majority group of owners who had never before sought one-on-one advice from specialists in forest management, 29% to 48% reported that they were "very likely" to do so in the next two years.

Analysis of the survey data indicated also that participation in the FS program helped to increase the present likelihood of owners pursuing four selected management purposes: harvesting timber for sale, improving wildlife habitat, preserving water quality, and applying agroforestry practices. For example, across the four regions 44% to 54% of the current participants said that they were more likely to improve wildlife habitat on their land compared "to your thinking on this subject before receiving your Stewardship Plan." The corresponding range for preserving water quality was 32% to 41%.

Importance of Cost-Sharing and Follow-up Technical Assistance

Across the four regions, majorities or near-majorities of the surveyed current participants had received cost-sharing and follow-up technical assistance (that is, advice received after the plan was approved and for carrying out the plan). In all regions most of both kinds of recipients directly stated that they would not have "done as much" plan implementation without the cost-share money or the technical assistance.

Separate analysis of survey data (using regression techniques) confirmed the causal connections between these two complementary-to-the-FSP programs and desirable managerial behaviors. After taking into account other causal variables, including the other type of assistance (cost

sharing or technical), the recipients of cost-sharing or of technical assistance were about three times more likely to have started to carry out their Forest Stewardship Plans compared to non-recipients;

- cost-sharing recipients were 1.3 times more likely to have applied a management practice that was new to them, while 1.6 was the parallel factor among owners who received follow-up technical assistance;
- cost-sharing participants spent on average an estimated $1,741 more on implementing their plans than did non-participants, while the receipt of technical assistance did not make a statistically significant difference in the level of such expenditure;
- conversely, technical assistance clients were two times more likely to have been applying practices recommended for at least two separate managerial purposes compared to a factor of 1.4 estimated for participants in cost-sharing.

Eliminating or gutting either type of assistance risks significantly reducing these types of behavioral benefits of the program.

Consequences of Self-Authored Stewardship Plans

Nationwide an estimated 9% of FSP participants wrote their own Stewardship Plans. These owners are mostly in the Pacific and Mountains states; and their plans were written through a process called "coached planning," whereby owners attend workshops that prepare them to develop their own plans. Regression analysis found that, compared to surveyed owners who had their plans written for them by specialists, the self-authors as a group spent more of their own (unreimbursed) money on plan implementation; and they were more likely to recommend "strongly" program participation to friends or family. However, they did not have a greater likelihood of having started to implement their plans, to be carrying out a multi-purpose approach to managing their forest land, or to have adopted practices that were new to them.

Participants' Evaluation of the Program

A program is unlikely to attract new participants or retain current clients if the latter tend to view it negatively. They will drop out and/or not recommend it to their peers. The evaluative questions asked of FSP clients yielded largely positive assessments.

- In each of the four regions almost all surveyed clients (more than 90%) found their plans "easy" or "very easy" to understand.
- The same pattern of responses was found for participants' assessments of doing the paperwork the program requires.
- Sixty-three percent to 67% reported that they would "strongly recommend" the program to their friends or family members.
- In each of the four regions, majorities of the respondents received follow-up technical assistance; and 61% to 69% of those recipients found it to be "highly useful."
- Among the relatively small number of surveyed participants who reported writing their own plans, opinions were divided over recommending to others the same approach to developing FSP plans. Only in one of the four regions did a majority of this kind of program client recommend that friends and family members should follow their examples.

In sum, with this last exception, when program clients were given opportunities to evaluate the

program, most chose to be positive. And most were implementing their plans appropriately.

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Chapter 1

Focus and Purpose of Report

Introduction

This report presents the findings from a national survey of participants in the Forest Stewardship Program (FSP) of the USDA Forest Service. Launched in 1991, the FSP provides technical assistance through state forestry agencies to help landowners develop management plans for their non-industrial private forestland (NIPF). These plans typically list the owners' objectives in managing their land and then recommend activities (e.g., planting trees, thinning), on a stand- or site-specific basis, to achieve each objective. For purposes of this program, non-industrial private forest acreage includes lands owned by any private individual, group, association, corporation, Indian tribe or other private legal entity, such as Alaska Native Corporations. Further, it includes rural lands with existing tree cover, or suitable for growing trees.

Our survey's main purpose was to gather information from the FSP's clients that would shed light on the program's effectiveness to date. We found considerable evidence of success, as well as some areas where improvement seems needed.

Authorized by the Cooperative Forestry Assistance Act of 1978, as amended by the Forestry Title of the 1990 Farm Bill, the Forest Stewardship Program (FSP) is ambitious both in the total acres of private forestland intended to be served--25 million in the program's first five years--and in the wide range of forest management purposes that its authors hoped would be promoted. Among the purposes given in the authorizing legislation are:

> managing and enhancing the productivity of timber, fish, and wildlife habitat, water quality, wetlands, recreational resources, and the aesthetic value of forest lands. . . , enhanc[ing] and sustain[ing] the long-term productivity of timber and nontimber forest resources to meet future public demand for all forest resources and provide the environmental benefits that result; and. protecting their [NIPF owners'] forests from damage caused by fire, insects, disease, and damaging weather.[1]

By September 1997 more than 130,000 plans covering about 16.5 million acres had been completed by foresters, wildlife biologists and other resource professionals in state agencies and

[1]Public Law 101-624, November 28, 1990, Subtitle A, Section 5, *U.S. Statutes at Large*. 101st Congress, 2d Session, vol. 4, Pt. 5.

private consulting firms (USDA Forest Service 1998). A year later the total number of plans increased to almost 149,000.[2] While the writing of this many plans is a major achievement, it represents also a heavy expenditure of scarce financial and staffing resources with, accordingly, less attention being given to other programs that provide service to NIPF landowners.[3] Lacking good information on the extent to which participating landowners are implementing their stewardship plans, some members of the forest community are expressing concerns that too much money is going into generating plans instead of getting work done on the ground. Others, on the other hand, believe that the technical assistance provided by FSP results in owners applying good stewardship practices.

At this early point in the report, the reader may ask, "So what if that technical assistance is shaping good behavior by owners of nonindustrial forestland? How important is such behavior to the country?"

The Importance of Nonindustrial Private Forest Lands

In 1992 nonindustrial private forestland (NIPF) comprised nearly half (48%) of all the nation's approximately 737 million acres of forest (National Research Council 1998).[4] Land owned by forest industry companies accounted for about another 10 percent, with the remainder representing publicly owned land. NIPF lands provide tremendous societal benefits including protection of watersheds and water quality, enhancement of habitat for fish and wildlife, provision of timber supplies, preservation of important cultural and historical sites, and promotion of recreational opportunities.

NIPF is an increasingly important source of timber production. In 1997 NIPF lands produced an estimated 59% of total domestic output of timber.[5] In the 1990 legislation authorizing the Forest Stewardship Program, Congress expressed the hope that NIPF's share of total timber supply would "rise with expanded assistance programs."[6]

Considerable potential exists for increasing production on NIPF land. Many owners who have

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[2]USDA Forest Service, 1999. "#Stewardship Plans (1991-1998)," unpublished table.

[3]Sampson and DeCoster (1997) reported on a recent series of telephone surveys with professionals in forest-related public agencies. . . [that found] an almost unanimous opinion that existing technical assistance programs are over-extended, with little prospects for significant budget increases in the foreseeable future (p. 40).

[4]Source: USDA Natural Resources Conservation Service, table reproduced in National Research Council 1998, p. 170. USDA s Forest Service classifies a parcel as forest land if at least 10% is covered with trees (National Research Council 1998, p. 26).

[5]USDA Forest Service, unpublished table.

[6] Public Law 101-624, November 28, 1990, Subtitle A, Section 2, *U.S. Statutes at Large*. 101st Congress, 2d Session, vol. 4, Pt. 5.

favored aesthetic, recreational, and other quality-of-life goals over timber harvesting may become more interested in harvesting as supplies from other sectors decrease. When surveyed about their objectives in owning forest land, NIPF owners have tended to rank production relatively low in importance, often seeing logging as detrimental to those higher-ranked objectives (Moulton and Birch 1995 and 1996, Birch and Moulton 1997, Young and Reichenbach 1987).

Because of NIPF owners' generally low interest in managing for maximum tree growth, their forests are underutilized sources of biomass for storing atmospheric CO_2 and therefore for fighting the effects of excessive carbon dioxide in the air. The National Research Council believes that NIPF offers "the greatest opportunity for increasing terrestrial carbon storage in the United States, because of their availability (compared with land currently in cultivation) and underuse as illustrated by their low stocking density and volume estimates" (1998, p. 68).

The management of forests may also critically affect the quality of water resources and the likelihood of flooding. It is estimated that about "60% of the nation's total stream flow" come from forests (Natural Resources Council 1998, p. 40). Over-harvesting of trees may increase total runoff to the point that downstream flooding occurs or is worsened. The run-off traveling through clumsily logged areas may pick up sediment, nitrates, and other pollutants that degrade water quality. In the "Findings" section of its 1990 amendments to the Cooperative Forestry Act, Congress observed that "over half of the forest lands of the United States are in need of some type of conservation treatment."[7]

Forest Stewardship Program's Objectives

Our reading of Congressional and USDA Forest Service documents indicates that the Forest Stewardship Program's main objective has been to motivate forestland owners to become more active, better-focused managers of their land. Previous studies and/or their own personal experience convinced the program's authors that NIPF owners tended to manage their land poorly or not at all. Both the authorizing legislation and program-implementation guidelines mandate technical assistance that enables owners "to more actively manage their forest and related resources."[8] A 1994 national survey found that only about 5% of private forestland owners possessed some kind of written management plan for their land (Birch 1996a). A study of NIPF owners in Louisiana estimated that around half of the state's total volume of growing timber was "under no management activity," that is, without benefit of systematic thinning, pest control, replantings to replace removals, or other practices of value to both the owners and the broader community (Lorenzo and Beard 1996).

The lack of managerial expertise may be particularly harmful to owner and community when

[7]Public Law 101-624, November 28, 1990, Subtitle A, Section 2, *U.S. Statutes at Large*. 101st Congress, 2d Session, vol. 4, Pt. 5.

[8]Public Law 101-624-Nov. 28, 1990, 104 STAT.3525, Sec. 5(a); and USDA Forest Service, 1994. *Forest Stewardship Program: National Standards and Guidelines* (Washington, D.C.).

timber is harvested. The Forest Service has warned that, without "technical forestry advice and assistance,"

> NIPF lands are frequently subject to poor resource management practices resulting in timber harvest with little regard for other forest resources including soil and water quality, the composition of tree species that will occupy the site in the future, wildlife habitats, and the monetary value of the residual stand as well as the monetary value of forest products removed during harvesting (USDA Forest Service 1997, p. 37).

Sampson and DeCoster (1997) cautioned that, because uninformed owners tend to harvest infrequently, perhaps only once during their ownership of the land, they cannot learn from their harvesting mistakes. Then the next owners may commit the same errors.

The FSP's authors aimed to promote a particular management approach--"multiple resource" or multiple-purpose. Forestlands tend to be more than a source of timber and timber products. As discussed earlier in this chapter, the authorizing legislation wants owners to be "managing and enhancing the productivity of timber, fish and wildlife habitat, water quality, wetlands, recreational resources and the aesthetic value of [their] forest lands."[9] The October 1999 explanation of the FSP available through the Forest Service's Internet site begins with a "Program Purpose" statement that endorses the simultaneous pursuit of these same purposes, characterizing them as "social, economic, and environmental benefits" of effective management based on good planning.[10] Plans prepared under the Forest Stewardship Program are expected to provide the owners with recommended practices for each stand of trees or other unit of management, with the recommendations based on informed assessments of the land's timber, soil, water, wildlife, and other resources (USDA Forest Service 1994).

Program Delivery Systems

The actual technical assistance is delivered by staff of state agencies or by private consultants whose work must meet state agency standards. The FSP's "National Standards and Guidelines" delegate overall responsibility to the State Forester in each state (USDA Forest Service 1994). The implementing state agencies have had a variety of names, including "Department of Forestry," "State Forestry Division," "Nebraska Forest Service" "Forestry Commission," "Division of Forestry Resources," "Department of Environmental Conservation," and "Department of Resource Conservation." Nationwide in 1995 these entities employed almost 3,500 professional foresters through whom technical assistance could be provided (Sampson and DeCoster 1997).

States have received federal financial assistance for writing FSP plans through two sources: their

[9] *Ibid*., section 5(d).

[10] USDA Forest Service, Cooperative Forestry, *1999. Forestry Stewardship Program: Helping Private Forest Landowners Develop Plans for the Sustainable Management of Their Forests.* URL=http://www.fs.fed.us./spf/coop/fsp.htm.

allocations both of FSP appropriations and of cost-share funds under the Stewardship Incentives Program (SIP). In the three fiscal years 1996 through 1998, total FSP appropriations stayed around $23 million, from which states paid their own staff or consultants to prepare plans at no cost to landowners. The cooperating state government is expected to match each grant dollar it receives from the FSP with a dollar of its own or with the equivalent in service or an in-kind contribution (USDA Forest Service 1994).

Since SIP is a cost-share program, plans developed through this funding source require owners to contribute to the cost of the plans. Also authorized by the 1990 Farm Bill, SIP has helped owners to implement such practices as "reforestation and afforestation," "soil and water protection and improvement," "riparian and wetland protection," and "wildlife habitat enhancement" (USDA Farm Service 1999, p. 1). About half of the states elected to use some of their shares of SIP funds also for writing stewardship plans. However, the great majority of all plans was funded through FSP appropriations rather than SIP money. A study for Fiscal Years 1991-1998 found that SIP paid for only 6.9% of the total plans written.[11]

An alternative approach to delivering technical assistance, used particularly in Montana and Washington, has been "coached planning." FSP money pays for educators to hold multi-session workshops attended by NIPF landowners. In Theoe and Bergstrom's study of workshops in two Washington counties, participants were offered eight sessions in which to "learn forest stewardship, practice their individual data collection/resource inventory, and apply what they have learned through the preparation and implementation of a[n approved] Forest Stewardship plan. . . . No plans are approved without an on-site visit" (1996, pp. 378-379).

Eligibility

The authorizing legislation restricted the program to privately owned "rural" land as opposed, let us say, to permitting help for public urban parks or private suburban estates. Also excluded by the 1990 statute was land currently being managed "under Federal, State, or private sector financial and technical assistance programs existing on the date of enactment of this section,. . . " except if the owners agree that their "forest management activities . . . [be] expanded and enhanced." [12] Otherwise the kind of planning aid that the legislation envisioned would be redundant. The federal government has not set a minimum or ceiling on how many acres of forestland an assisted owner may have, although States are free to do so.

Standards of Good Forest Stewardship Plans

According to the USDA Forest Service's implementation guidelines for the FSP, plans should: "Be prepared or verified, as meeting the standards of a forest stewardship plan, by a professional resource manager"; involve landowners "in plan development by setting clear objectives",

[11] Source: U.S. Forest Service, 1999. unpublished table, 1999.

[12] Public Law 101-624--Nov. 28, 1990, ATT, \3526, Sec 5(e).

"identify and describe actions to protect, manage, maintain and enhance relevant resources listed in the law (soil, water, range, aesthetic quality, recreation, timber, water, and fish and wildlife) in a manner compatible with landowner objectives"; provide "[p]rescriptions or treatments [that are] integrated and stand or site specific"; and "be approved by the State Forester or a representative of the State Forester" (USDA Forest Service 1994, pp. 4-5).

B. D. New and colleagues observed that, previous to the FSP, landowners wanting to pursue multiple purposes--such as timber production, wildlife protection, and recreational enhancement-- "were faced with obtaining advice, management planning assistance, and financial incentives, if available, from a number of different federal and state agencies" (1997, p. 28). Under FSP and its sister cost-share program, SIP, such owners ideally should have to make only two "stops." They receive multi-purpose planning help via FSP from a state agency or delegated private consultant, and then with an approved FSP plan in hand they apply to USDA's Farm Service Agency for SIP cost-share money.

Nature of the Survey

Extending from late July 1998 through May 1999, our national survey consisted of telephone interviews and mailed-backed questionnaires from over 1,200 forestland owners who participated in the Forest Stewardship Program. A separate random sample was drawn for each of four regions of the country: Pacific States, Mountain and Plains States, Southern States, and Northern States (see Figure 2.1 in Chapter 2 for a map delineating the regions). Fortunately for the potential usefulness of the study, most of the surveyed owners were not brand new clients, with only initial program contacts to report. As will be discussed in Chapter 2, across all regions more than two thirds of the respondents had received their written FSP plans at least 18 months before the survey had begun.

The survey questions asked of participants fall into two major categories: those related to program administration and those seeking to determine the extent to which the FSP has shaped participants' managerial behaviors.

Program Administration

A series of questions focused on the demographics of the clients, including standard items such as age, income, education, and the number of acres included in their plans. In describing the program's clients, we sought to learn, among other things, if the program had been effective in reaching owners who never before had received professional advice for managing their forest lands, and to document participation by minorities and women. We also asked the owners to rate the planning assistance they have received in terms of whether they had learned something useful, and if they would recommend that other landowners participate in the program. And we made inquiries to determine how the results achieved through coached planning, wherein owners learn to prepare their own plans, compared with the traditional method of having plans completed by natural resource professional after conferring with individual landowners on their management objectives and intentions.

Landowners' Managerial Behavior

Questions were asked to determine whether and to what extent landowners had begun to implement recommended practices, and whether the plans had been effective in promoting a multi-purpose approach to management, as contrasted with activities designed to accomplish a single purpose. Of interest, also, was whether owners were sufficiently committed to their plans to spend significant amounts of their own funds to implement practices.

An important part of our analysis is the *linkage* between program administration and change in landowner behavior. We wanted to know if the propensity to implement plans was related to certain landowner characteristics, but not to other traits, and to the type of program delivery. An especially critical question is the extent to which improved land stewardship can be achieved through forest stewardship plans alone, in comparison with achievements when plans are reinforced by follow-up planning assistance and/or the availability of cost sharing for practice installation, as through the Stewardship Incentive Program.

Plan of the Remainder of the Report

Chapter 2 evaluates the representativeness of the survey's sample of owners and then profiles the respondents by region as to their gender, race, income, amount of forestland they own, and whether they had previously received technical assistance, among other traits.

Chapter 3 analyzes the surveyed owners' reports about plan implementation, including whether they had begun to apply management practices recommended in their plans, whether the commenced activities amount to multi-purpose management of the land, and if the program had leveraged substantial expenditures of the clients' own money for plan implementation.

Chapter 4 reports on evidence that, for most respondents, participation in the Forest Stewardship Program had changed their managerial behavior. Among the reported kinds of change was the adoption of at least one practice that was new to them. Another kind was becoming "very likely" to use professional advisers compared to never having consulted with them before the FSP. A third was having begun to subscribe to print or electronic sources of information on managing their land. A fourth type consisted of changes in owners' intentions towards their land. Many respondents said that they had become more likely to harvest for sale, to promote wildlife habitat, or pursue other objectives compared to before they had participated in the FSP.

The fifth and final chapter draws policy inferences from the survey's findings, particularly regarding the clients' perceptions of their plans, their willingness to recommend the program to friends and family, and the effectiveness of clients writing their own plans, participating in cost-sharing, and receiving follow-up technical assistance.

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Chapter 2

Who Responded to the Survey

Introduction

This chapter begins by evaluating the extent to which our 1,238 respondents were representative of participants in the Forest Stewardship Program (FSP). If the representativeness is low, the report's usefulness to program policy-makers and other stakeholders will be low. Next, the chapter profiles the respondents' personal background and ownership characteristics. Information on gender, race, age, educational attainment, acres of forestland owned, and prior experience with forestry advisers, among other traits, should be useful to program managers as they strive to deliver services in ways sensitive to their clients' diversity.

These clientele profiles also set the stage for analysis presented in chapters 3 to 5. There we examine these same variables as potential causal explanations for differences reported in the surveyed owners' managerial behavior and attitudes towards the FSP. For example, we test whether, on average, owners with relatively high personal incomes spent more of their own money to implement their Forest Stewardship plans compared to respondents with low incomes. We check also for whether satisfaction with the program differed according to prior experience with professional forestry advisers, level of education, and other personal background characteristics.

This chapter ends with comparisons between the FSP participants whom we surveyed in 1998-1999 and the respondents to a 1994 national survey of owners of private forestland conducted by USDA's Forest Service. The two studies permit comparisons by region. We found that the FSP owners had age distributions similar to those of the broader group, ranked a little higher occupationally, and tended to own a great deal more forest land.

Representativeness of the 1998-99 Respondents

The representativeness of the respondents to our 1998-99 survey depends on two factors:

(1) how our samples of program participants were drawn, and

(2) how high were the response rates that we obtained.

Biased samples yield biased results regardless of how close to 100% is the response rate. But even with an initially representative sample, survey findings will not be representative if many of those well chosen program clients cannot be reached or, when contacted, choose not to participate in the study.

Chapter 2: Who Responded

The Sampling Processes

To enhance the usefulness of the study's findings, we constructed four separate samples–one each for the four regions, Pacific States, Mountain and Plains States, Southern States, and Northern States.[13] The map in Figure 2.1 shows the states included in each region. When national-level indicators were needed, we converted the findings from the four separate regions into percentage breakdowns or averages for a "weighted national sample." The weighting procedures are discussed a little later in this chapter.

Aiming to generalize from each region's sample to all participants in the Forest Stewardship Program for that region, we needed to build our samples from lists of actual FSP clients. Forty-five of the 50 state government agencies administering the program sent us state-wide lists of clients; and in one case we obtain the needed names and addresses from district offices within the state. Hawaii was deliberately passed over because records available to us indicated a total of only 28 plans having been written for the entire state through Fiscal Year 1997 (USDA Forest Service 1998). Idaho's exclusion derived from a state statute that prohibited releasing names and addresses of agency clients. Lists were also not available for Michigan and North Dakota. From the other 46 states we obtained a total of 61,737 names of landowners (Table 2.1).

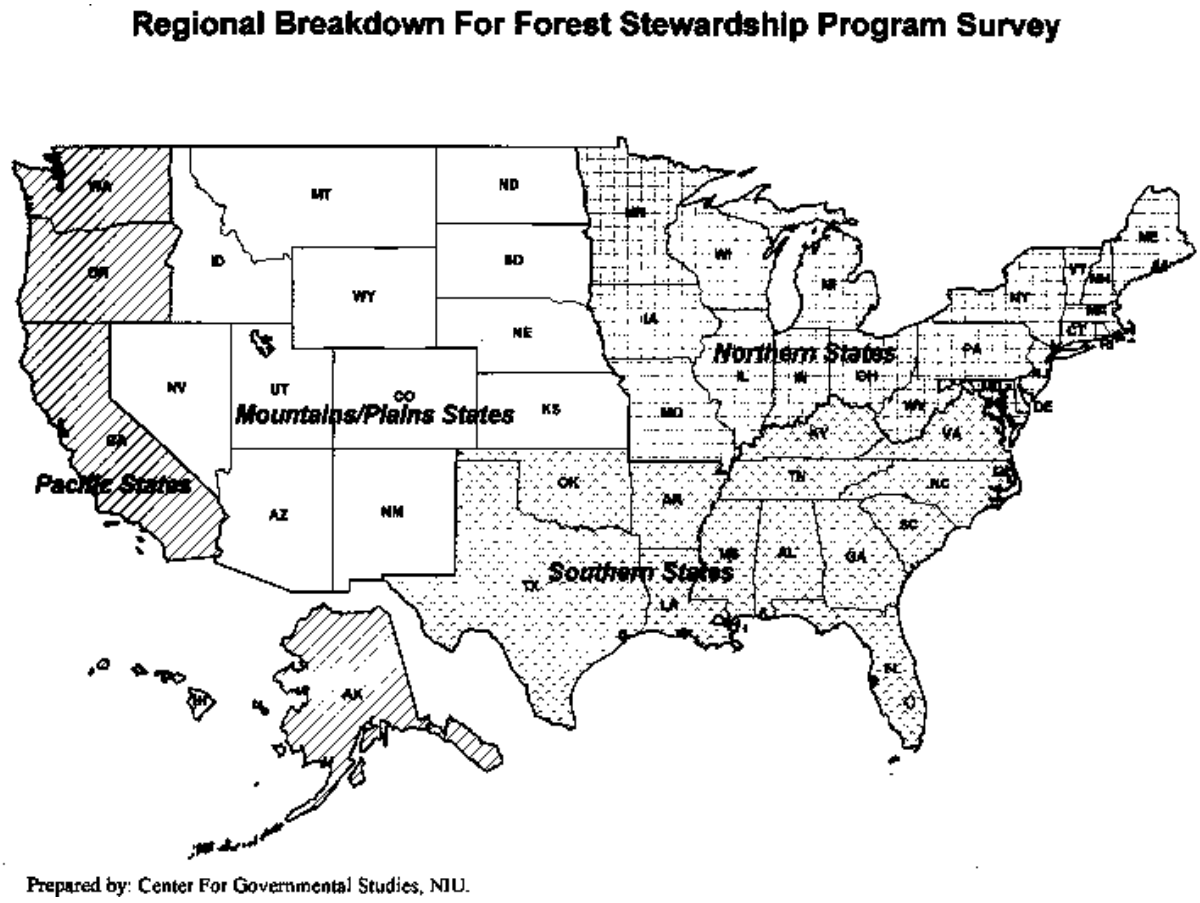
Table 2.1. Comparison of regional breakdowns of Forest Stewardship Program participants found in lists provided by state agencies that administer the program with regional breakdowns of cumulative numbersf FSP Plans written during Fiscal Years 1991-1997

	Numbers of Clients in Lists Obtained for 1998-1999 Survey		Cumulative Numbers of Plans Written: Fiscal Years 1991-1997*	
Region	**Number**	**Percentage of Total**	**Number**	**Percentage of Total**
Pacific States	4,537	7%	3,950	3%
Mountains and Plains States	4,559	8%	9,145	7%
Southern States	19,194	31%	25,902	19%
Northern States	33,447	54%	94,206	71%
Total	61,737	100%	133,203	100%

[13]The "**North**" is USDA Forest Service's Northeastern Area (Connecticut, Delaware, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, Vermont, West Virginia, and Wisconsin). The "**South**" is Region 8 (Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, and Virginia). The "**West**" is broken into Pacific States (Alaska, California, Hawaii, Oregon, and Washington), plus the "**Mountains/Plains**" (Arizona, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, New Mexico, North Dakota, South Dakota, Utah, and Wyoming).

Chapter 2: Who Responded

Figure 2.1. Map Delineating Administrative Regions



*Source: "Table 35 Summary of forest stewardship plans and acres accomplished by States" (USDA Forest Service1998)

The regional breakdowns for the total numbers of *participants* in our lists parallel rather well the regional distribution of the total number of FSP *plans* completed in Fiscal Years 1991-1997 (Table 2.1). The 20 states that comprise the USDA Forest Service's Northeastern administrative area (which we label "Northern States") accounted for 54% of the total of 61,737 owners' names, the 13 Southern States had 31%, and the other two regions--Pacific States and Mountains/Plains States--comprised 7% and 8%, respectively. In the percentage breakdowns for total numbers of plans,1991-1997, the Northern States also ranked first by far (with 71%), the Southern States came second (with 19%), and the two other regions both had less than 10%.

We did not anticipate a perfect match since the two records measured different (though related) phenomena--"clients" versus "cumulative written plans." More than one plan may have been written for the same client, and some early participants may have dropped out of the program and from the lists of clients sent to us. Moreover, in the process of aggregating numbers of persons served at the local level to the state level, mistakes can be made (Krause and Jackson 1983).

While we cannot be certain that all FSP clients were included in the given lists, the recorded names do comprise a large total--over 61,000. Having received names and addresses from all or almost all states per region,[14] we could draw the regional samples in single stages, thus avoiding error due to a second or further stage of sampling. For example, in the initial random sample of 634 owners drawn for the Northern States, each of the total of 33,447 names sent to us by those 19 states had an equal chance of being included in the sample. Perhaps there were more than about 33,000 owners who had participated in the FSP in those states; but at least for that large regional total, our sample of 634 was representative. The same assessment applies to the initial samples of 512 to 717 owners drawn for the other three regions. They were representative of the names sent to us. Moreover, as discussed above, the regional distribution of the given names matches rather well the only other national-level data available to us--a report on the cumulative total number of plans written, per state, from the program's inception through September 1997.

Response Rates

We label the group of 634 Northern States' forestland owners an "initial sample" in order to differentiate them from the sample of actual respondents who, for that region, totaled 353 owners. We shall use the Northern States' sample to illustrate how the response rates per region

[14]From all 13 of the Southern States, 19 of the 20 Northern States (excepting Michigan), 4 of the 5 Pacific States (excepting Hawaii with its very few plans), and 10 of the 12 Mountains/Plains states (the exceptions being Idaho and North Dakota).

Table 2.2. Component parts of initial regional samples: Each part's percentage of the total

Components	Pacific States %	Mountains and Plains States %	Southern States %	Northern States %
Sampled owners who completed survey by telephone or mail	43 (305)	54 (275)	46 (305)	56 (353)
Owners who were contacted and refused to participate	4	3	5	5
Owners who could not be contacted by phone or mail	30	23	24	15
Owners who had died or were too sick or infirm to participate in the survey	3	1	3	2
Owners not eligible for survey (had sold land, had not completed application for FSP, received aid under different program, or on list by mistake)	18	14	15	11
Owners not interviewed because of over-sampling	2	5	9	11
Total percentage	100	100	100	100
Total owners in the initial sample	(717)	(512)	(671)	(634)

were calculated. As shown in Table 2.2 the 634 originally selected owners fall into six groups.

(1) the largest, 353 or 56% of the total, consists of the forest landowners from that region who participated in the survey via telephone interviews or mailed-back questionnaires.

(2) The second group, 5% of the Northern States' total, consisted of owners who refused to be interviewed. They turned us down over the phone or by mail. Across the four regions they ranged from 3% to 5% of the original samples.

(3) The third group were "no contact" cases. They could not be reached either by telephone or by mail. They varied from 15% in the Northern States' sample to 30% in the Pacific States' total initial cases (Table 2.2).

(4) A fourth, small component of the initial sample in all four regions were owners who had died or were too ill to be surveyed.

(5) The fifth was a third set of listed owners (11% in the initial Northern sample) who, when contacted, turned out to be ineligible for the survey. They had either sold their forestland or were on the list by mistake. In the latter subgroup were owners who reported that they had shown interest in the FSP program, perhaps by attending meetings or calling state forestry offices, but they had never completed an application or signed a plan. Also included in the

ineligibles were a few government foresters or private consultants whose names must have been on the list because they were service providers rather than program clients.

(6) The sixth and final group (also 11% in the Northern States) formed a "reserve" of cases that we did not need to call. We reached our goal of completions for that region before having to call anyone from this reserve group.

For each region, we aimed for 300 actual respondents. That goal was exceeded slightly in the Pacific States and in the South, with 305 completed surveys in those two regions (Table 2.3). The Northern States' total was as high as 353 because we received back more mailed questionnaires than anticipated. The latter were sent to owners with unlisted or non-operating phone numbers, as well as to phone contacts who preferred to participate via the mails. By contrast, the Mountains and Plains States fell below the 300-case goal. We decided to stop with the 275 completions we had for that region, since they represented enough cases for useful analysis and the other three regions had already reached 300 completions.

When calculating the response rate, like other survey researchers (Lavrakas 1987, Fowler 1993), we count the "refusals," "no-contacts," and "respondents," but not the "ineligibles." The rate is a percentage–with the total respondents being the numerator and the denominator comprised of the sum of the respondents, the "refusals," and the "no-contacts." Our rates per region ranged from 63% in the Pacific States to 76% in the Northern States (Table 2.3). An overall, national-level response rate was calculated in the following way. We weighted, i.e., multiplied, the response rate percentage for each region by its share of the total number of names in the lists sent to us by the 46 states--61,737. For example, the Pacific States' rate, 62.5%, was multiplied by 7.3% or .073; and the Northern States' rate, 76.2% was weighted by its share, 54.2% or .542.[15] The sum of the weighted rates is 71.5%, which we label as the response rate for the "weighted national sample."

As Hatry and colleagues (1998) tell us, "Opinions differ substantially as to what adequate response rates are" (p. 27). Rates below 50% are probably unacceptable, while percentages of 75% or higher are unusual (p. 27). Our 71.5% is therefore comparatively high.

[15]Other national-level measures, such as averages or percentages, are derived in the same way. For example, our estimate of the national percentage of FSP owners who started to implement wildlife-protection management practices (discussed in Chapter 3) consists of the sum, across the four regions, of the percentage of each region's surveyed owners who said, "yes," they had started, weighted by that region's share of the total of FSP clients on our lists

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Table 2.3. Response rate for each region and the weighted national sample				
Categories or Potential Respondents	**Pacific States**	**Mountain and Plains States**	**Southern States**	**Northern States**
1. Forest Stewardship Program owners who did participate in survey	305	275	305	353
2. Owners who refused to participate	29	17	31	30
3. Owners for whom no phone or mail contact could be made but who were potentially eligible for the survey[2]	154	97	128	80
4. Total potential respondents = sum of rows 1 through 3	488	389	464	463
5. Response rate = row 1 divided by row 4	62.5%	70.7%	65.7%	76.2%
6. Weighted national sample **= 71.5%** (the sum of the weighted response rates for each region, with the weight per region equal to its share of the total number of Forest Stewardship Program participants found on the lists provided by 46 states).				

[2]We made a downward adjustment in the numbers for the "no-contacts" category of respondents according to what we had learned from speaking with persons or their relatives for whom we did have valid phone numbers. Many of the latter were not eligible for the survey. In some cases the listed owner had died or was too infirm to participate in the survey. Another group of ineligibles had sold the land that had been the subject of FSP plans. Yet others told us that they had "never" had plans. This group included persons who had applied for a plan or otherwise shown interest in the program, but had not completed an application or signed a plan. Finally, some people were apparently on the lists by mistake. For example, several professional foresters, both from government and the private sector, must have been listed because they had helped to write plans. Our downward adjustment was that, among the owners whom we were unable to contact (by phone or mail), we assumed that the proportion of them who fell into one of these ineligibility categories was the same as the proportion we found among the owners whom we did contact.

Profile of Respondents

This section of the chapter profiles the FSP participants whom we surveyed and who answered questions about their backgrounds. The information consists of estimates, derived from the samples, of how the program's clients break down by:

- gender
- race
- formal education
- personal income
- age

- occupation
- total forestland owned
- proportion of that land covered by FSP plans
- length of time respondents owned their land that was under a Stewardship plan
- year when the FSP plan was written
- proximity of owners' personal residence to the land under the plans, and
- whether respondents had previously received professional technical assistance.

Since these measures derive from regional samples, the estimates are useful only at that level and when aggregated to the national level. They cannot be applied to individual states. The values for the "Weighted National Sample" presented in the following tables were calculated just as we did the overall response rate of 71.5%. Each response per region was multiplied by its region's share of the national total of owner names sent to us by the 46 states.

The discussion that follows is limited to FSP participants as of the time of the survey. They reported having "active plans," in contrast to the 6% to 11% of the respondents per region (Table 2.4) who told us they had dropped out of the program or were inactive. These persons usually did not say anything else. Since the FSP was no longer of much or any relevance to their lives, they tended to end the interviews quickly. Therefore, most of our demographic tables describe the then current participants, who comprise 89% to 94% of the total respondents across the regions.

Table 2.4. Status of forest program participants as of time of survey: Percentages who reported selves as active and inactive/dropouts, by region

Trait	Pacific States	Mountain and Plains States	Southern States	Northern States	Weighted National Sample*
Active	89	89	90	94	92
Inactive/dropouts	11	11	10	6	8
Total respondents	(305)	(276)	(305)	(353)	(1,220)

*****To arrive at the national-level values, each response was given three weights. (1) The first weight was its region's fraction of the total number of Forest Stewardship participants found in all the lists sent to us by the participating state offices. (2) The second weight adjusted for the size of the final regional sample. We took 305 to be the desired total since two of the four regions achieved that number of completions. The responses from the Mountains/Plains states' were therefore weighted by 1.11 (305/275) so as to make them equivalent to the responses in regions with a total of 305 completions, while the responses from the Northern Region were multiplied by .864 to achieve the same outcome. (3) Then the responses for all four regions were multiplied by 4.0 so as to have a national total of 1,220, rather than 305. The former total is much more representative of the sum of completions (1,238) than if we had not added the final weight of 4.0.

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In the next three chapters we use the collected data on participants' characteristics to test for whether differences in managerial behavior and opinions about the FSP are related to, and perhaps in part caused by, differences in gender, income, etc. Evidence of statistically and practically significant relationships may help program policy makers in their decisions about the FSP. If (as we found) important behaviors and positive attitudes are more likely to be present with certain levels of personal income, acres under an FSP plan, or years of owning the land, among other traits, program features may be adjusted to take account of those apparent causal factors.

Gender, Race, Education, and Income

Regarding gender, race, and education, the active FSP participants whom we surveyed were similar to the nonindustrial private forest owners who responded to previous studies (Bourke and Luloff 1994, Sampson and DeCoster 1997). Regardless of region, our respondents were overwhelmingly male, white, and well educated. Across the four regions, from 72% to 86% of our respondents were male (Table 2.5). The percentages of females were significantly higher in the Pacific and Mountains/Plains states, with 27% and 22%, respectively, compared to the Southern and Northern regions, both with 14%. Not many of the completions (9% to 14%) consisted of cases where the listed owner was a female by herself. Additional cases involved

Table 2.5. Gender and race of responding current FSP participants. Percentages by region

Trait	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Males	72	77	85	86	84
Females	27	22	14	14	15
Did not answer	0	0	0	1	1
White	94	96	95	98	96
African-American	0	0	1	0	0
Hispanic-American	0	2	0	0*	0
Native-American	0	0	2	0	1
Asian-American	1	0	0	0	0
Other	3	1	0	1	1
Did not answer	3	2	2	2	2
Total respondents	(272)	(245)	(274)	(331)	(1,120)

*Three tenths of a percent or one person in the Northern States' sample identified himself as Hispanic American.

joint male-female ownership. We speculated that the percentages of female respondents may have been reduced by a tendency of husbands, rather than wives, to do the survey when the land was jointly owned by spouses. Males did answer the questions in three-quarters of the joint-ownership cases of two regions; but in the other two, males and females were represented in equal proportions.

The preponderance of males among current FSP clients may simply reflect the reality that men own most of the country's private forestland. In a national survey of owners of private forestland, conducted in 1978, sixteen percent of the total respondents were female (Birch et al., 1982), which is very similar to the female share of our weighted national sample, 15% (Table 2.5).

The domination of whites among our respondents was even greater than the ascendancy of males. Across the four regions 94% to 98% of the surveyed current FSP participants classified themselves as “White American" (Table 2.5). Only the Southern States included *any* African-American respondents; they comprised just 1% of that region’s total; and Hispanic Americans were represented in only two regions: 2% of the Mountains/Plains States and 0.3% in the Northern States’ sample. The 1978 national survey cited in the previous paragraph found proportionally many more African-American owners in the South (9% of that region's total), but none in the Rocky Mountain and Pacific regions, and less than 1% in the North (Birch et al., 1982). Hispanic owners were trivial in numbers except in the North, where they comprised 0.4% of that region's total respondents. Of course, ownership patterns may have changed greatly over the 20 years between the two studies. However, our numbers suggest a need for more effective outreach to minority owners of forestland, especially among African Americans in the South.

The program respondents whom we surveyed had considerably more formal education than the average adult. A March 1998 survey by the U.S. Census Bureau estimated that 24% of the nation’s residents 25 years and older had received bachelor’s degrees (Day and Cury 1998). By contrast, across our four regional samples, the percentages of respondents with at least a college degree ranged from 49% to 61% (Table 2.6).

Table 2.6. Highest level of formal education completed by responding current FSP participants. Percentages by region					
Educational Attainment	**Pacific States**	**Mountain and Plains States**	**Southern States**	**Northern States**	**Weighted National Sample**
Up to and including completion of high school	28	26	27	33	30
Associate's degree	17	16	11	18	15
Bachelor's degree	27	31	31	23	26
Graduate degree	28	26	30	26	27
(At least a bachelor's degree)	(55)	(57)	(61)	(49)	(53)
Did not know or no answer	1	1	1	2	1
Total percentages	100	100	100	100	100
Total respondents	(272)	(245)	(274)	(331)	(1,120)

Since education and income are usually related, it was not surprising that the surveyed FSP participants tended to report comparatively high incomes. While the Census Bureau estimated the median household income nationally for 1997 to be $37,303 (U.S. Bureau of the Census 1998), the medians for the same year reported by our four samples of FSP participants were all in the range of $50,000 to $75,000 (Table 2.7).[16]

[16] Our survey questions asked for "your income . . . after any business expenses but before taxes." Here we are comparing it to the Census Bureau's findings regarding median household income in the event that some of our respondents combined their own income with spouses' earnings.

Table 2.7. Reported incomes in calendar 1997 of responding current FSP participants. Percentages by region					
Income Categories	**Pacific States %**	**Mountain and Plains States %**	**Southern States %**	**Northern States %**	**Weighted National Sample %**
Less than $15,000	4	**5**	4	5	**5**
$15,000 to less than $25,000	10	7	6	7	**7**
$25,000 to less than $50,000	26	27	25	31	28
$50,000 to less than $75,000 (median range)	**22**	**19**	**22**	**19**	**20**
$75,000 to less than $100,000	12	12	10	11	11
$100,000 and above	17	18	27	16	20
No information	8	12	7	11	5
Total Respondents	272	245	274	33.1	1,120

Age, Occupation, and Acres of Forestland Owned

Regarding the three owner characteristics of age, occupation, and acres of forestland owned, we can make comparisons directly to the findings of a more general, fairly recent survey of private forestland owners in the nation. Both our study and the 1994 survey by the USDA Forest Service referred to earlier in the chapter included questions on these three variables. While our survey sampled from a subset of private owners (those in the FSP), the 1994 survey focused on private owners in general. In making these comparisons, we include all participants whom we contacted, whether or not they answered the questions about age, occupation and acres owned. For the relevant tables (2.8, 2.9 and 2.10) the weighted national sample totals to 1,220 rather than the 1,120 reported in earlier tables. We added the nonrespondents because the 1994 study also includes significant numbers of cases of nonrespondents on two of those questions. The additions should make the two studies' findings more comparable.

Table 2.8's comparisons of the distributions of occupations suggest that FSP participants are a somewhat higher status group relative to the generality of private forestland owners. We use the verb, "suggest," and the adjective, "somewhat," because the percentage-point differences are not large and both studies suffered from non-response error. The 1994 study's findings were derived from a national survey that achieved an overall 50.3% rate of response (Birch 1996a). Our regional response rates ranging from 63% to 76% were better, though short of the 100% ideal.

Therefore, when the differences between two sample surveys' findings are relatively small, like those in Table 2.8, where none exceed 12 percentage points, words like "suggest" and "somewhat" are normally required.[17] In tables 2.8 through 2.11, the 1994 survey is referred to as the "Birch Study," after the principal author, Thomas W. Birch.

Table 2.8's entries on percent of respondents reporting being "retired" as their primary occupation" show little variation both across the regions and for the comparisons between our survey and the Birch study. All the values are within the narrow range of 21% to 30%. That is, about a quarter of the surveyed owners were retired. Active farmers accounted for less than 8% except in the Mountains and Plains States, where they comprised 23% of our sample and 16% of the comparison group.

Only small differences of either kind (across regions or within them) were found also for the occupational category, "Non-farm manager." But for the category, "Professionals," there are consistent, nontrivial disparities within regions. Proportionally more of the FSP participants—7 to 11 percentage points more—fell into this grouping. If the percentages for "Professional," "Other white collar," and "Skilled worker" are aggregated, the disparities increase, except for the Mountains and Plains States' sample. Elsewhere, from 11 to 16 percentage points more of the FSP respondents are in this combined occupational grouping compared to the private owners surveyed in 1994.

The somewhat higher status of the FSP clients is suggested also by the within-region comparisons for the category, "Other non-white collar." In all regions relatively fewer of the FSP respondents identified themselves as being in this group; and the differences (5 to 12 percentage points) are numerically nontrivial except in the Mountains/Plains region.

[17] The non-normal case would be when the nonresponse error is trivial.

Table 2.8. Occupations of surveyed FSP participants, compared to findings of 1994 survey of private forestland owners in same regions. Percentages by region

Occupational Categories	Pacific States %		Mountain and Plains States %		Southern States %		Northern States %		Weighted National Sample %
	This Survey	Birch Survey	This Survey	Birch Survey	This Survey	Birch Survey	This Survey	Birch Survey	This Survey
Retired	27	30	21	22	23	27	28	29	26
Farmer	7	4	23	16	8	7	8	8	9
Non-farm manager	11	18	11	13	15	11	13	12	13
Forest operator	9	___	2	___	6	___	4	--	5
Professional	21	14	22	14	21	9	22	12	22
Other white collar	7	4	4	8	9	9	8	5	8
Skilled worker	7	5	6	7	6	7	9	5	7
Other non-white collar	4	13	4	9	4	16	5	14	4
No response	7	13	7	12	8	16	5	14	6
Total percent	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100	100
Total Owners	305	644,600	275	385,700	305	4,940,200	353	3,931,200	1,220

The two surveys' findings regarding owner's age are very similar. In all regions and in both samples, only a few surveyed owners—1% to 6%--were less than 35 years old (Table 2.9) . The most common age category was 35 to 54. In the regional samples for the FSP study, from 42% to 48% of the respondents fell in this range. The owners' surveyed by Birch and colleagues had similar age distributions, except in the Mountains/Plains and Northern States' samples, where somewhat more of their respondents were in the 65 and over group and fewer were from 35 to 54, compared to the FSP respondents. However, the comparisons for average age—whether within the same region or across all regions—show small differences. All eight means vary within the six-year range of 53.4 to 59.4 years (Table 2.9).

Table 2.9. Age of surveyed FSP participants, compared to findings of 1994 survey of private forestland owners in same regions: Percentages by region

Age Categories	Pacific States %		Mountain and Plains States %		Southern States %		Northern States %		Weighted National Sample %
	This Survey	Birch Survey	This Survey	Birch Survey	This Survey	Birch Survey	This Survey	Birch Survey	This Survey
up to 34	4	1	6	0	4	6	4	6	4
35 to 54	48	43	42	36	46	41	46	342	47
55 to 64	19	17	26	24	21	21	23	20	22
65 and over	23	28	19	30	22	23	22	28	22
No response	6	11	8	10	8	9	5	13	5
Total percent	100	100	100	100	100	100	100	100	100
(Average age)	(56)	(58)	(53)	(59)	(55)	(56)	(54)	(57)	(550
Total Owners	305	644,600	275	385,700	(305)	4,940,200	353	3,931,200	1,220

By contrast, the two groups of surveyed owners differ very markedly on the trait, the number of forestland acres owned. Across the four regions, from 52% to 64% of the owners surveyed in 1994 reported that they owned fewer than 10 acres (Table 2.10). In our 1998-99 regional samples, the respondents in that size category ranged from less than 1% in the Southern States to 26% in the Mountains/Plains sample. The acreage range of 10 to 49 acres accounted for about a third of our respondents in three regions. The Southern and Northern states' sample had more than a third in the next range, 50 to 199 acres, while the South stands out with its high percentage of surveyed FSP owners (28%) falling in the category of 200 to 999 acres.

As mentioned towards the end of Chapter 1, the USDA Forest Service stated in its Internet information about the FSP, "Generally, FSP participants own less than 1000 acres; however, there is no maximum ownership restriction" (USDA Forest Service 1999). Our survey confirmed that assessment. Across the four regional samples, the percent of FSP owners with 1,000 or more acres ranged from 3% in the Pacific and Northern States to 7% in the South (Table 2.10). The South's respondents had the highest average number of acres, 438 (Table 2.10). The Mountains/Plains States ranked second with 321 acres. By comparison, the averages reported by respondents to the broader 1994 survey ranged from 37 acres in the Northern States to 66 acres in the Mountains/Plains region (Table 2.10).

Table 2.10. Acres of forestland owned by surveyed FSP participants, compared to findings of 1994 survey of private forestland owners in same regions. Percentages by region

Acreage Categories	Pacific States %		Mountain and Plains States %		Southern States %		Northern States %		Weighted National Sample %
	This Survey	Birch Survey	This Survey	Birch Survey	This Survey	Birch Survey	This Survey	Birch Survey	This Survey
1 to 9 acres	8	61	26	53	0	64	4	52	5
10 to 49	36	26	32	32	17	24	33	33	28
50 to 199	27	10	18	11	36	10	41	13	37
200 to 999	13	2	6	3	28	2	12	2	17
1,000 and above	3	1	5	1	7	0	3	0	4
No response	13	---	13	---	12	---	7	--	9
Total percent	100	100	100	100	100	100	100	100	100
Average acres	(167)	(47)	(321)	(66)	(438)	(43)	(218)	(37)	(289)
Total Owners	305	644,600	275	385,700	305	4,940,200	353	3,931.200	1,220

Land under Approved Plans, Length of Ownership, and Year When FSP Plan Was Written

Table 2.11 focuses on two important measures of the forestland that the surveyed FSP owners had placed under approved plans: the number of acres and the ratio of those acres with a plan to the owners' total forest holdings. The ideal was to have assisted owners manage contiguous acres, plus relatively nearby land, according to a professionally approved plan. Table 2.11's ratios of land under plans to total land owned suggests that this goal was reached in most cases. Although our survey questioning was not so detailed that the reported acreages differentiated among noncontiguous holdings, it looks as though about two thirds of the respondents in each region had one or more plans for all their land. That is, the acres they reported under plans equaled their total reported forestland acres (Table 2.11). Such high percentages with all land covered by FSP plans represent a considerable achievement by the program.

The average amount of acres under plans per owner varied considerably across the regions—from 139 acres in the Pacific States to 398 acres in the Mountains/Plains region (Table 2.11). The median values were considerably lower—ranging from only 15 acres in the Mountains/Plains States to 102 in the Southern region.

Table 2.11. Land under a professionally approved plan: Number of acres and ratio of land under a plan to the owners' total holdings of forestland. Values for current FSP participants, by region								
	Pacific States		Mountain/Plains States		Southern States		Northern States	
	Acres	Ratio	Acres	Ratio	Acres	Ratio	Acres	Ratio
25th percentile	18	.85	4	.50	50	.75	26	.75
50th percentile (median)	40	1.0	15	1.0	102	1.0	60	1.0
75th percentile	120	1.0	65	1.0	278	1.0	120	1.0
Average	139	.87	398	.78	253	.83	151	.85
Percent of owners with ratios of 1.0	--	69%	--	66%	--	64%	--	66%
Number of respondents	270	269	241	237	265	263	329	326

Table 2.12 indicates that, by the time of the survey, large majorities (82% to 92%) of the responding current participants in the FSP had owned forestland covered by the plans for at least five years. From 46% (in the Mountains/Plains States) to 61% (Pacific region) were owners for at least 11 years. The average years of ownership ranged from 16 years in the Mountains/Plains States to 19 years in both the Pacific and the Southern states.

Table 2.12. Number of years in which current program participants have owned the land covered by first or only Forest Stewardship Program Plan					
	Pacific States %	Mountains and Plains States %	Southern States %	Northern States %	Weighted National Sample %
One year or less	1	1	2	2	2
Two to four years	6	16	14	13	13
Five to 10 years	31	36	25	24	26
11 to 20 years	22	17	21	25	23
Over 20 years	39	29	37	35	36
No response	1	2	2	1	1
Total percentage	100.0	100.0	100.0	100.0	100.0
Average years	(19)	(16)	(19)	(18)	(18)
Total cases	272	245	274	331	1,120

Table 2.13 presents the survey's findings as to when the respondents' Forest Stewardship Plans were written. Across all four regions, about two thirds (67% to 71%) reported their plans as being at least 18 months old, i.e., written in 1995-96 or earlier. Since we began interviewing in July 1998, any plan written by the end of 1996 was at least a year and one-half old. This finding was encouraging in the sense that such large majorities had at least that amount of time or more[18] to have begun to implement their plans before we surveyed them.

[18] A total of 176 respondents both reported their plans being written in 1995-96 and were surveyed before the end of 1998. For any of them who received their plans between July 24th and the end of December 1996, two full years may not have elapsed before we surveyed them.

Table 2.13. Years in which surveyed participants first or only Forest Stewardship Plan was written. Percentages by region

Year Plan Was Written	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
1991-1992	23	18	15	26	22
1993-94	24	21	23	19	21
1995-96	24	27	29	23	25
1997-98	6	14	10	12	11
Can't remember	8	6	9	8	8
Won't say or no answer	15	14	14	12	12
Total percent	100	100	100	100	100
Total respondents	(305)	(276)	(305)	(353)	(1,220)

Respondents' Place of Residence

Table 2.14 focuses on whether the surveyed program clients lived on the land they were supposed to manage according to their FSP plans' recommendations. In chapters 3 through 5 we test the hypothesis that the owners who do live on that land manage their land differently (i.e., better). In three of the regions (excepting the Southern States), majorities of the responding current program participants reported that land under FSP plans contained their principal residences. With the additions of other owners who said they lived on such land at least one month per year, the percentages of clients with close residential ties to program land increase to a range of 51% to 76% (Table 2.14). Previous studies found that the typical nonindustrial private forestland owner lived on or close to his/her land (Bourke and Luloff 1994).

Table 2.14. Place of residence of current program participants: Percentages who lived at least one month per year on forestland covered by their FSP plans, by region

Measure of Residence	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Such land includes their principal residence	55	64	42	52	50
They otherwise live on such land for at least one month per year.	10	13	9	11	10
(Lived on land for at least 1 month)	(65)	(76)	(51)	(62)	(60)
Did not live on land at least 1 month	35	24	49	38	40
Total Respondents	272	245	274	331	1,120

Previous Experience with Professional Advisers for Managing Their Forestland

The final table for this chapter, Table 2.15, has two functions. It completes our discussion of the question that heads the chapter, "Who responded to the survey?" It also provides a transition to chapters 3 to 5, which address evaluative questions about the implementation of the Forest Stewardship Program. Here we ask whether the FSP was reaching the kind of forestland owners who needed the technical assistance the program could provide. According to this survey, the actual clientele consisted largely of persons likely to benefit from that aid. Among the surveyed participants with active plans, from 57 % in the Pacific States to 73 % in the Mountains/Plains States reported that they had never before received professional advice in managing their forest land (Table 2.15). *In this important respect, the program's implementation was a success*. It was not mostly serving the people who had had the motivation and/or personal contacts to obtain such assistance in the past.

Table 2.15. Has the FSP been reaching owners who beforehand had not received advice from a specialist in managing forestland? Percentages of current program participants who had and had not received such aid, by region*

	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Yes, had received	41	26	40	29	33
No, had never received	57	73	58	69	65
Not sure	2	1	2	2	2
Total percentage	100	100	100	100	100
Total respondents	270	244	272	331	1,120

***Text of question:** "Before you signed up for the Forest Stewardship Program, had you ever received advice for managing your forestland from a specialist in managing forestland?

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Chapter 3

Implementation of the Forest Stewardship Plans

Introduction

This chapter analyzes the surveyed owners' reports about implementing their Forest Stewardship Program (FSP) plans. Technical assistance designed to shape behavior must ultimately be judged by its behavioral yields. Our survey findings indicate very considerable yields. We might have found the opposite; most program clients might have reported no progress yet in carrying out their plans' recommendations, offering various plausible excuses including the complaint that the plans were inadequate or unrealistic. Or, if participants had started something, they might have been focusing on one objective rather than taking a multi-purpose approach to managing their forestland, as Congress had intended.

This chapter is organized around the following evaluative questions:

- Were most of the assisted owners applying at least some of the activities recommended in their professionally approved plans?
- What were the reasons given for not implementing recommended activities?
- Did the plan implementation reported by most respondents amount to multi-purpose approaches to managing forest land?
- Was one of the FSP's behavioral outcomes that its participants invested significant amounts of their own money in implementing the plans?
- Was the FSP cost-effective in the sense that non-reimbursed expenditures by owners approximated or even exceeded the costs to the federal government of preparing the plans?
- Was the governmental cost-sharing aid and follow-up technical assistance that complemented the FSP found to be effective? Was either associated with higher implementation effort by the recipient owners, or would most of these recipients have done as much in the absence of such additional aid?

Chapter 4 examines a set of three other questions about whether the FSP changed participants' behavior. Specifically, that chapter assesses evidence as to whether the program induced its clients to adopt new management practices, to use new types of information for deciding how to manage their land, and to change their objectives for the forestland they owned.

Chapter 3: Plan Implementation

Extent of Plan Implementation

To inventory the contents of the sampled owners' Stewardship Plans, the survey questionnaire asked if they contained recommended management activities with any of the following six purposes:

- "Growing trees or caring for their health, such as planting trees, thinning trees, or fighting tree pests or diseases."
- "Harvesting or marketing your trees, such as which trees to cut or when to cut and sell them."
- "Improving or preserving your forestland as habitat for wildlife, including mammals, birds, fish, or other wildlife."
- "Improving or preserving the quality of water resources like developing filter strips near ponds, fencing off streams from livestock, or reducing soil erosion near rivers or lakes."
- "Agroforestry, such as building windbreaks or blending the growing of trees with cropping or pasturing."
- Some other purpose.

When owners replied "yes" about a purpose (e.g., harvesting or marketing trees), they were asked three follow-up questions: Had they been able to start carrying out any of the recommended activities for that purpose? If so, which activities had they started? And were any new to the owner?

Across all four regions, large majorities of the program participants—from 81 percent (in the Pacific States) to 86 percent (Northern)--reported that they had begun to implement their plans (Table 3.1). That is, the owners said they were applying at least one recommended activity (e.g., thinning trees) for at least one managerial purpose. Figure 3.1 illustrates the remarkable consistency in the regions' percentages on this measure. The corresponding value for the weighted national sample was 84%.

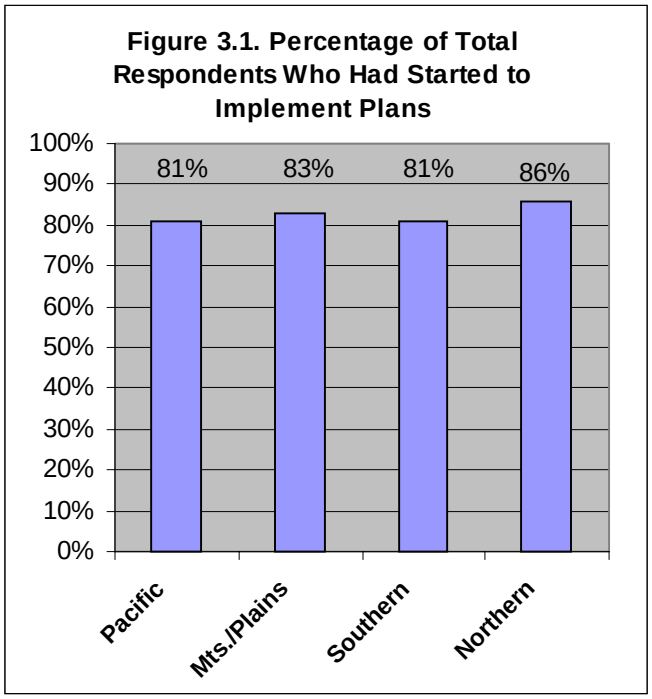
Table 3.1. Progress in carrying out plans: Percentages of total surveyed owners reporting they had or had not started to implement their plans: By region

	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample* %
Started	81	83	81	86	84
Not begun	8	6	9	8	8
Dropped out or inactive	11	11	10	6	8
Total percentage	100	100	100	100	100
Total respondents	(305)	(275)	(305)	(353)	(1,220)

*****To arrive at the national-level values, each response was given three weights. (1) The first weight was its region's fraction of the total number of Forest Stewardship participants found in all the lists sent to us by the participating state offices. (2) The second weight adjusted for the size of the final regional sample. We took 305 to be the desired total since two of the four regions achieved that number of completions. The responses from the Mountains/Plains states' were therefore weighted by 1.11 (305/275) so as to make them equivalent to the responses in regions with a total of 305 completions, while the responses from the Northern Region were multiplied by .864 to achieve the same outcome. (3) Then the responses for all four regions were multiplied by 4.0 so as to have a national total of 1,220, rather than 305. The former total is much more representative of the sum of completions

(1,238) than if we had not added the final weight of 4.0.

These percentages are high; and as with any survey, there is the possibility of measurement error. The extent of plan implementation may be exaggerated. We look at two common causes of error: the possibility of respondent misstatement and the potential for error when the nonresponse rate is significant. First, did many of the surveyed owners fabricate activity to make themselves look good? There are three reasons to doubt that many did. First, we asked each owner who reported plan implementation to specify activities being carried out. Over 82 percent gave us two or more different activities. Fabrication becomes less likely when it requires multiple, specific misstatements. Moreover, we tried to assure non-starters that that their status was legitimate. Each question about starting planned activities was prefaced with an excuse for non-implementation: "For lack of time or other reasons, some owners have not begun carrying out their plan's recommended activities, while some owners have started. Have you been able to . . .?" A third reason to trust the reports about starting to implement plans is that responses from the same owners to other questions were consistent with implementation. Eighty percent of all the owners giving those reports said that they had received either cost-sharing or follow-up technical assistance for carrying out plans.



Another potential cause of overstatement of the degree of plan implementation shown in Table 3.1 is nonresponse error. Chapter 2 reported that the survey's overall response rate was 72% of

the eligible respondents. How many of the 28% whom we failed to reach might have reported no plan implementation whatsoever? To answer this question, some kind of assumption must be made about their behavior. We chose the extremely conservative assumption that *all* of the nonrespondents had done *nothing* with their plans. This choice permits us to make a rather precise statement about the minimum percentage of all program clients—nationally—who would report some plan implementation if we had somehow surveyed them. If all 28% were inactive, we are highly confident (95 in 100 confident) that at least 58% of the participating owners would report that they had started to apply some part of their FS plan.[19] The percentage in the full population of FSP clients is probably much closer to our sample finding of 84%, but this very conservative assumption allows us to trust that it is at least 58%.

The Drop-Outs

Across the four regions from 6% to 11% of the respondents reported that they had dropped out of the program or were inactive (Table 3.1). The national-level estimate is 8%. As mentioned in Chapter 2, most of these two kinds of respondents, totaling 116 owners, did not permit us to ask questions about why they had dropped out; they were not interested in being interviewed. Among the 20 owners who did discuss why they left the program, their given reasons included: no cost-sharing money was available in their state to help implement the plans or they failed to budget enough money to cover their parts of the cost share; they were dissatisfied with the plans or with the lack of follow-up technical assistance; they had tried to apply the recommended management activities but found practical impediments, such as their land being too wet; and they simply lost interest. One man stopped because he had retired and developed other interests.

The Non-Starters

Across the regions we found that 6% to 9% of the surveyed owners had not begun to implement their plans but still considered themselves participants in the program (see Table 3.1's second line of data). These respondents totaled 96 in number. When we asked them "why not" questions for each type of managerial purpose for which they reported no progress, 168 separate explanations were offered. The most common reason, given in 24 percent of these responses, was lack of time to carry out the recommendations. However, in most of these cases the FS plan was *not* of such recent origin that little if any progress could be expected. Fifty-eight percent of these particular owners reported that their plans had been written at least 18 months prior to the survey.

The second most frequent explanation—comprising 15 percent of the non-starters' explanations—were arguments to the effect that the timing was not yet right to apply the practices (e.g., the trees were not mature enough to be harvested). And the third (14 percent of

[19] The 58% estimate was derived in the following way. We add all the nonrespondents in the weighted national sample, 474, to the 1,220 respondents. The sum of those two values, 1,694, becomes the new base for calculating the unadjusted percentage of FSP clients who reported that they had started implementing their plans. Dividing 1,694 by the number of respondents who said they had begun, 1,024, yields 60.4%. Then we account for sampling error by estimating the 95% confidence interval for a sample of 1,694 where the population from which the sample was drawn numbered 61,734 and the sample finding was 60.4%. That interval is plus or minus 2.3 percentage points. Subtracting 2.3 from 60.4 yields our estimate of 58%.

the total) was lack of funding, especially from formal cost-sharing programs.

Types of Forest Managerial Purposes Being Implemented through the Plans

As stated earlier in this chapter, the management activities we expected to find in FSP plans were divided into six types of purposes; and we asked, type by type, if the surveyed owners' plans included any such activities. If they did, there was the follow-up question: Had the owner "been able to start carrying out any of the recommended activities" of that type? "Growing trees or caring for their health" comprised the type of managerial purpose for which the highest percentage of owners reported some progress in plan implementation (Table 3.2). Across the four

Table 3.2. Progress in carrying out plans: Percentages of total surveyed owners reporting they had started to implement recommended activities, by managerial purpose and by region, with the percentages who had such a purpose in their plans—whether carried out or not-- given in parentheses

Managerial Purpose	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Growing or caring for trees[1]	77 (84)	70 (77)	69 (80)	65 (77)	68 (79)
Improving or preserving forestland as wildlife habitat[2]	45 (57)	52 (65)	66 (78)	56 (69)	58 (71)
Harvesting or marketing trees[3]	24 (38)	15 (21)	27 (47)	37 (58)	31 (49)
Improving or preserving the quality of water resources[4]	24 (32)	25 (32)	34 (43)	20 (28)	25 (33)
Agroforestry activities[5]	9 (11)	38 (46)	6 (10)	8 (9)	10 (12)
Other purposes[6]	3 (na)	2 (na)	2 (na)	4 (na)	3 (na)
No activity had been started or dropped out	19	17	19	14	11
Total Respondents	(305)	(275)	(305)	(353)	(1,220)

Texts of relevant survey questions:

[1] Does your plan recommend activities having to do with *growing trees or caring for their health*, such as planting trees, thinning trees, or fighting tree pests or diseases?

[2]Does your Stewardship Plan recommend any activities for *improving or preserving your forestland as habitat for wildlife,* including mammals, birds, fish, or other wildlife?

[3]Does your plan recommend activities having to do with *harvesting or marketing your trees,* such as which trees to cut or when to cut and sell them?

[4]Does your Stewardship Plan recommend any activities for *improving or preserving the quality of water resources* like developing filter strips near ponds, fencing off streams from livestock, or reducing soil erosion near rivers or lakes?

[5] Does your Stewardship Plan recommend any activities for what may be called *agroforestry*, such as building windbreaks or blending the growing of trees with cropping or pasturing?

na = not available

regions from 65% to 77 % of the surveyed owners said that they had started to carry out at least one recommended activity of this type (e.g., "planting trees, thinning trees, or fighting tree pests or disease"). Second in relative frequency in all regions was "improving or preserving your forest land as habitat for wildlife," with activity reported by 45 percent to 66 percent of the respondents. "Harvesting or marketing your trees" ranked third or lower in all regions.

Table 3.2's implementation percentages depended greatly on whether a particular managerial purpose was contained in the FSP plans. For example, proportionally more surveyed owners reported having begun to carry out practices for improving wildlife habitat, compared to agroforestry activities, because many more respondents had included the former type of managerial purpose in their plans compared to the latter. The percentages in parentheses found in Table 3.2 tell us what proportion of owners in a region reported that their FSP plans contained such a purpose. For example, in the Pacific, Southern, and Northern regions only 9% to 11% of the surveyed owners with active plans reported having agroforestry practices (such as windbreaks). By contrast, in the Mountains and Plains states, with their many areas of sparse natural tree growth, this type of managerial purpose was much more frequently reported—by 46% of that region's total respondents. Accordingly, in the first three regions only 6% to 9% reported having begun to implement agroforestry activities, while the corresponding percentage in the Mountains and Plains States was 38%.

Across all regions the rather general managerial purpose, "growing and caring for trees," ranked first in frequency of being reported in FSP plans among the five specified purposes (see again Table 3.2's percentage values in parentheses). "Improving wildlife habit" was second in all cases. "Harvesting/marketing ranked third in three regions and fifth in the Mountains/Plains states. This latter purpose's percentages—21% to 58% being in the FSP plans--suggest that the Forest Stewardship Program may have made some progress in overcoming the tendency of private forest land owners to ignore or minimize timber production in favor of other objectives (Sampson and DeCoster 1997, Theo and Bergstrom 1996). That tendency was indicated in two sets of findings from the U.S. Forest Service's 1994 national survey of private forestland owners. In all regions, "timber production (growing timber or other forest products for sale)" ranked last among eight choices when respondents were asked to report their most important reason for owning woodland. It was the selection of only 1% to 4% of the surveyed owners (Birch 1996b, 1997a, 1997b). Secondly, just 2% to 7% reported that it would be the primary benefit of ownership expected over the next 10 years. However, as discussed in Chapter 2 (Table 2.10), our surveyed owners tended to have larger forest land holdings than the typical NIPF owner.

We tested whether the implementation of "harvesting/marketing" purposes in FSP plans varied by size of the respondents' holdings. Fifty-nine percent of the individual owners in the 1994 survey held fewer than 10 acres; 87% had fewer than 50 acres (Birch 1996a). Moreover, that

study's owners of relatively small parcels tended to value timber production less than did respondents with larger tracts (Moulton and Birch, 1995 and 1996). On small parcels timber harvesting may be uneconomic; there may not be enough mature trees to justify the expense of cutting and trucking the logs to saw mills. Also, owners of modest tracts may oppose logging because it would leave them with too few trees to enjoy for recreational or aesthetic purposes (Straka, Wisdom, and Moak 1984).

For our test in each region, we divided the surveyed owners into four groups of equal numbers of cases arranged in ascending order by size of their holdings. In every region the percentage of respondents implementing at least one of the "harvesting/marketing" activities recommended in their FSP plans increases significantly--by at least 18 percentage points--between the lowest and highest acreage group. In most cases the percentage changes from first to second group, second to third, and third to fourth are increments, that is, they are consistent with the hypothesis that, as size of holdings increases, so does the likelihood of pursuing harvesting or marketing as a management purpose in the FSP plan (Table 3.3).

We applied the same analysis to the four other kinds of management purposes reported as being in the FSP plans: growing/caring for the health of trees, improving/preserving wildlife habitat, improving/preserving water quality, and applying agro-forestry practices. Size of forest land holdings did not correlate with the likelihood of implementing recommended activities for the first, second, or fourth of these kinds of purposes. It did with carrying out water quality purposes in three of the four regions, the exception being the Northern States (Table 3.4). However, we should restate the qualification made three paragraphs earlier. Our sample of owners tended to have forest land holdings that are larger than those of a typical cross-section of NIPF owners (see Table 2.10).

Table 3.3. Relationship between size of forestland holdings and percentage of owners per group implementing "harvesting/marketing" activities recommended in their FSP Plans. By region

Groups Demarcated by the Quartile Values*	Pacific States %**	Mountain and Plains States %**	Southern States %**	Northern States %**
1. From the respondent with the smallest acres to the one just before the owner whose acre value was 25% of the way through the total array of cases; that case is the 25th percentile	15	0	24	27
2. From the 25th percentile to just before the 50th percentile	20	4	19	38
3. From the 50th percentile to just before the 75 percentile	36	23	29	48
4. From the 75th percentile to the case with the highest number of acres	33	42	45	47
Total respondents with active plans	(272)	(245)	(274)	(331)

*The quartile values per region are as follows: In the Pacific states they were 20, 45, and 140 acres; in the Mountains/Plains States=5, 25, and 80 acres; in the Southern States=60, 122.5, and 321.25 acres; and in the Northern States=32.25, 75, and 150 acres.

**The percentages were statistically significantly different down the four groups of respondents; the level of significance in the chi-square test was less than .005 except in the Northern States sample where it was .02.

With water quality activities, the causal effect of increased size of holdings may derive from the presence of streams or other bodies of surface water. We found that, except in the Southern States' sample, the probability of having such bodies increased with number of forestland acres owned. For example, while 64% of the Pacific States' respondents in lowest quarter of cases (i.e., they owned fewer than 20 acres) reported streams or other surface water on or near their land, 95% did among the surveyed owners in the fourth quarter (they owned 140 acres or more).

Table 3.4. Relationship between size of forestland holdings and percentage of owners per group implementing FS plan-recommended activities for improving/preserving water quality. By region

Groups Demarcated by the Quartile Values*	Pacific States %**	Mountain and Plains States %**	Southern States %**	Northern States %**
1. From the respondent with the smallest acres to the one just before the owner whose acre value was 25% of the way through the total array of cases; that case is the 25th percentile	17	16	32	18
2. From the 25th percentile to just before the 50th percentile	20	24	32	19
3. From the 50th percentile to just before the 75 percentile	28	27	37	24
4. From the 75th percentile to the case with the highest number of acres	42	43	55	24
Total respondents with active plans	(272)	(245)	(274)	(331)

*The values per region that demarcated quartiles were as follows: In the Pacific states they were 20, 45, and 140 acres; in the Mountains/Plains States=5, 25, and 80 acres; in the Southern States=60, 122.5, and 321.25 acres; and in the Northern States=32.25, 75, and 150 acres.

**The percentages were statistically significantly different across the three of the four groups of respondents, the exception being the Northern States' sample; the level of significance in the chi-square test was less than .02 except in the Northern States sample where it was too high (.68) for us to reject the null hypothesis of no differences greater than chance sampling area alone could explain.

In our 1998-99 survey the management purpose, "improving or preserving the quality of water resources," ranked fourth across the regions in the percentage of owners reporting it in their plans. Its relatively low frequency may derive in part from many owners not regarding water quality as a problem relevant to their land. The survey instrument included the question: "Does the forestland covered by your Stewardship Plan have any streams, ponds, lakes, rivers, or other bodies of water on it or right next to it?" In the four regions from 11% to 41% of the owners with active plans said, "no"; and only minor percentages of those respondents (12% to 21% of them) reported having a water quality activity in their FSP plans (Table 3.5). Among the "yes" respondents, proportionately many more said their plans contained such activities.[20] For example, 76% of the Pacific States' respondents reported having some body of water on or adjacent to their forest land; and the plans of 44% of those owners contained some kind of water quality activity (Table 3.5). The corresponding percentage for the 24% from that region without

[20] In all four comparisons, the differences were statistically significant (at the .000 level in a chi-square test).

water bodies was just 14%.

Table 3.5. Among the surveyed owners with active plans, the percentages reported having a body of water on or adjacent to their forest land, * and comparisons among those who did and did not as to whether their Forest Stewardship Plans included water quality activities. By region.

Response Option	Pacific States %	Mountains and Plains States %	Southern States %	Northern States %
Yes, have body of water on or next to their forest land	76	58	87	76
(Percent of this subgroup reporting water quality activities in their plans)	(44)	(46)	(54)	(36)
No, do not have body of water on or next to their forest land	24	41	11	24
(Percent of this subgroup reporting water quality activities in their plans)	(14)	(21)	(17)	(12)
Total respondents	(272)	(245)	(274)	(331)

***Text of question:** "Does the forestland covered by your Stewardship Plan have any streams, ponds, lakes, rivers, or other bodies of water on it or right next to it?"

The Southern Region ranked first in the percentage of respondents with surface water on or near their land (87%), first in the percentage with some water quality activity in their FSP plans (43%--Table 3.2), and first also (34%) in reporting implementation of that type of activity (Table 3.2).

Particular Recommended Activities Being Carried Out

The surveyed owners were asked to list the particular recommended activities, if any, that they had begun to carry out under each of the five specified management purposes, plus an "other" category. Tables 3.6 through 3.9 present the three most frequently mentioned activities per type of purpose. The rankings are based on the percentages of all respondents with active plans in a region that reported having started to carry out a mentioned activity. Across all four regions planting trees or thinning trees ranked first or second for the management purpose, "growing and caring for trees," while the group of practices labeled "clipping, trimming or pruning" ranked third in two of the four regions (Table 3.6).

Table 3.6. Three most frequently reported activities for "Growing or Caring for Trees" that had been started: Percentage of respondents reporting each activity. By region								
Activities Recommended in Forest Stewardship Plans	**Pacific States**		**Mountains and Plains States**		**Southern States**		**Northern States**	
Growing or Caring for Trees	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Thinning or marking for thinning	1st	50	2nd	31	2nd	33	1st	38
Planting	2nd	49	1st	34	1st	38	2nd	32
Clipping, trimming, pruning	3rd	13	--	--	--	--	3rd	10
Weeding, mowing, spraying for weeds	--	--	3rd	11	--	--	--	--
Fire breaks	--	--	--	--	3rd	16		
Respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)

Under the purpose, "improving or preserving wildlife habitat," there was more diversity in the most frequently commenced activities that were reported (Table 3.7). Developing or keeping natural cover (e.g., building brush piles or leaving logging slash) ranked first in the Pacific and Northern states and third in the other two regions. Planting or keeping trees and shrubs for animal food was first or second in importance for the Mountains/Plains, Southern, and Northern states; artificial shelters were the second most frequently mentioned activities in Pacific states; and creating or maintaining food plots was second in the South.

The table (3.8) for the management purpose, "harvesting or marketing trees" is less complex, indicating more similarity in the recommended activities being carried out. Across all four regions, the largest percentages of owners reporting activity of this kind mentioned logging, cutting, or harvesting. The second- and third–ranked activities included thinning, marking or tagging for later logging, and various aspects of marketing.

The percentages reported in Table 3.9 for "improving or protecting water quality" are smaller compared to the other three tables because relatively fewer respondents who had begun to implement recommended practices with this management purpose reported the same type of activity. For example, across the four regions the most frequently mentioned activity–buffer and filter strips for erosion control--was listed by no more than 5% to 7% of the total respondents with active plans.

Table 3.7. Three most frequently reported activities for "Improving or Preserving Wildlife Habitat" that had been started: Percentage of respondents reporting each activity, by region								
Activities Recommended in Forest Stewardship Plans	**Pacific States**		**Mountains and Plains States**		**Southern States**		**Northern States**	
Improving/Preserving Wildlife Habitat	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Developing or keeping natural shelter (e.g., build brush piles, leave logging slash)	1st	19	3rd	11	3rd	14	1st	22
Building artificial shelters (e.g., bird houses)	2nd	12	--	--	--	--	--	--
Creating or protect water habitat (lakes, ponds, streams)	3rd	11	--	--	--			
Planting/improving tree stands or planting grass	--		1st	15	--		3rd	10
Creating/maintaining food plots	--	--	--	--	2nd	23		
Planting or keeping trees, shrubs, etc., for animal food	--	--	2nd	11	1st	26	2nd	15
Total respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)

Table 3.8. Three most frequently reported activities for "Harvesting or Marketing Trees" that had been started: Percentage of respondents reporting each activity, by region								
Activities Recommended in Forest Stewardship Plans	**Pacific States**		**Mountains and Plains States**		**Southern States**		**Northern States**	
Harvesting or Marketing Trees	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Cutting, logging, or harvesting	1st	13	1st	12	1st	16	1st	26
Thinning including not for sale	2nd	7	3rd	5	2nd	7	--	--
Selling, marketing, taking bids	3rd	6	2nd	7	3rd	6	2nd	11
Marking and tagging for harvest	--	--	--	--	--	--	3rd	5
Total respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)

Table 3.9. Three most frequently reported activities for "Improving or Preserving the Quality of Water Resources" that had been started: Percentage of respondents reporting each activity, by region								
Activities Recommended in Forest Stewardship Plans	**Pacific States**		**Mountains and Plains States**		**Southern States**		**Northern States**	
Improving/preserving the quality of water resources	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Unspecified erosion control	1st	8	1st	7	1st	8	3rd	3
Buffer and filter strips	2nd	6	--	--	2nd	7	1st	5
Creation or management of ponds, creeks, or rivers	3rd	4	--	--	3rd	7	--	--
Stream side management	--	--	3rd	3	--	--	--	--
Fencing out of livestock	--	--	2nd	6	--	--		
Planting bulbs, seedlings, & trees	--	--	--	--	--	--	2nd	5
Respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)

This series of tables about activities being implemented does not include one focusing on agro-forestry practices because significant numbers of respondents reported them only for the Mountains and Plains states. There, the only practice mentioned by more than small percentages of surveyed owners were windbreaks. Thirty-three percent of respondents with active FSP plans in that region reported that they had begun or completed installing the windbreaks that their plans recommended. Several gave their reasons for implementing this practice—to protect livestock, crops, and gardens, as well as to shelter their homes. Two listed the number of trees they planted for such purposes: 200 in one case and 379 in the other. A third told us that developing a good windbreak involved both adding some new trees and "tearing out" some old.

Relative Progress in Beginning to Implement Types of Recommended Activities

We tested whether progress in beginning to implement activities recommended in Forest Stewardship Plans varied by the type of management purpose. For example, owners who reported harvesting and marketing of trees as a purpose may have deferred implementation because at the time of the interviews the tree stands under their plans were too immature to be cut.

Table 3.10 shows that across the four regions from 85% to 92% of the surveyed owners with "growing or caring for trees" as a management purpose in their FSP plans reported having begun to implement at least one activity with that purpose. The corresponding percentages for "harvesting or marketing trees" were considerably lower—from 56% in the Southern states to 74% in the Mountains and Plains states. The ranges of percentages for the other three purposes fell between these first two.

Table 3.10. Reported progress in implementing plans in the sense that recommended activities have started to be carried out					
Among the respondents reporting a particular managerial purpose in their plans, what percentage said that they had started to carry out at least one activity with that purpose? By purpose and by region*					
Managerial purpose	**Pacific States %**	**Mountain and Plains States %**	**Southern States %**	**Northern States %**	**Weighted National Sample %**
Growing or caring for trees	92	90	87	85	86
Harvesting or marketing trees	62	74	56	64	62
Improving or preserving forest land as wildlife habitat	78	79	84	82	82
Improving or preserving the quality of water resources	76	79	80	74	77
Agroforestry activities	81	82	66	82	78
Total Respondents Varied with Purpose of Activity					

***Texts of relevant survey questions:**
For lack of time or other reasons, some owners have not begun carrying out recommended activities, while some owners have started. How about you? Have you been able to start carrying out any of the recommended activities for growing or caring for trees? . . . for harvesting or marketing your trees? . . . .improving or preserving forestland as wildlife habitat? . .. improving or preserving the quality or water resources? . . . agroforestry recommended activities?"

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Reported Reasons for Not Having Started

As discussed earlier, when respondents said no activity whatsoever had been started for a managerial purpose included in their plans, we asked them to explain. The given reasons differed markedly by kind of managerial purpose. Among the 197 owners who had not started to carry out harvesting or marketing activities recommended in their plans, 54% explained their inaction in words like "trees are not old enough," and "wait until 2015." Eight percent said that they simply lacked the time to address this part of their FS plan (Table 3.11). Only 2% blamed their inaction on lack of money to carry out the activities, and 5% attributed it to poor market prices. Seven percent mentioned difficulty in finding someone to log their land, such as because the parcels were too small or too remote.

We conducted the same type of analysis for the 152 surveyed owners whose plans contained the managerial purpose, "improving or preserving forestland as wildlife habitat," but who reported no activity for achieving that aim. For 25% the explanation was simply that they had lacked the time to start implementing this part of their plan (Table 3.11). Another 13% said that wildlife habitat activities were not yet scheduled or could not be started because prior components of their FSP plans had to be completed first. In other words, one part of the plan was dependent on another. For example, recently planted trees had to mature in order to provide useful habitat. Or felled trees could not become homes to animals until the planned logging had occurred. Six percent said that they did nothing either because their understanding of the plan was that no

actions were expected of them or because they decided their land already had enough wildlife. For example, one owner said, "No need now; the animals are in good shape." Ignoring part of the plan makes sense if the owner finds that conditions have changed or his/her original assessment of the land's needs has altered. Nine percent of the 152 owners attributed their inactivity to financial problems, including lack of governmental cost-share money.

Table 3.11. Percentage of owners (across all regions) giving selected reasons for not starting to carry out any of the recommended activities for a management purpose in their Forest Stewardship Plans. By type of purpose*

Type of Reason	Harvesting or market-ing %	Improving wildlife habitat %	Improving water quality %	Growing or caring for trees %
Activity not yet scheduled	54	13	16	8
No time; too busy with other activities	8	25	24	21
Lack of money	2	9	17	13
Believed no activity by them was required, or changed mind about doing this kind of activity.	5	6	17	7
Could not find contractors to do the work	7	3	1	5
Poorly drawn plans or follow-up technical assistance	3	2	6	4
Total respondents (across all regions) who had not started activities of this type	(197)	(152)	(88)	(112)

*Percentages do not sum to 100% because not all types of reasons are presented.

Our analysis of respondents' reasons for not starting water-quality-improvement activities also yielded practical and attitudinal explanations for inaction. Seventeen percent of the 88 respondents in this group (i.e., they had water-quality management purposes in their plans but reported no activity) blamed their inaction on lack of money. Some of the planned activities required considerable expenditures such as for fencing cattle out of streams and hiring bulldozers for developing a pond. Sixteen percent explained that the water-quality component of their plan would be implemented in future years, such as after the planned logging took place, because only at that time or particularly then would water pollution become a significant potential problem. Again, we found a significant percentage of this group of non-starters, 17%, who either believed that no activity was required or they had changed their minds about doing something. One said, for example, "Actually, water quality was good." Another explained, "The stream bank conditions are excellent; nothing to work on"; and a third told us, "I just don't cut trees near the water." He believed that the absence of that activity was all the FS plan asked of him, and he could have been right.

Among the 112 surveyed owners who reported no progress in carrying out the "growing/caring for trees" activities in their plans, the most common reason was lack of time, given by 21% of those surveyed owners. Thirteen percent attributed their inaction to money problems. Only 8% said that kind of activity was not yet scheduled.

As we scanned the explanations for non-implementation, we were struck by the very small

number of cases where surveyed owners attributed their inactivity to badly designed plans or poor follow-up technical assistance. Only 3% did so regarding harvesting or marketing, 2% when discussing wildlife habitat, 6% about wildlife habitat, and 4% of the owners giving their reasons for not starting activities for growing/caring for trees. Among the 41 respondents who had yet to start any of the agroforestry practices in their plans, not a one blamed either the plans or technical help.

In summing up this section on reasons for inaction, we note also that lack of money was mentioned by only 2% to 17% of the respondents covered in Table 3.11. Its frequencies were consistently fewer than the reason, lack of time. Precise rankings, however, should not be made when the available data are responses to open-ended questions. We recorded what came into the minds of the surveyed owners when asked why they had not started any activity for a management purpose contained in their FSP plans. In a more extended set of questions, the same owners might have mentioned financial obstacles as frequently as time constraints. Nevertheless, Table 3.11's data suggests that money is not a major limitation to FSP clients *beginning* to carry out their plans' purposes. Perhaps it will be more of an obstacle to completing the entire plans.

Progress towards Managing Forestland with a Multi-Purpose Approach

Across the four regions, majorities of the surveyed owners--55 percent to 68 percent-- reported that they had begun to implement recommended activities for at least two separate kinds of management purposes such as improving tree stands *and* protecting wildlife (Table 3.12). Thirty-one percent to 42 percent reported progress in achieving three different kinds of purposes. As discussed earlier, one of the Forest Stewardship Program's major goals was to encourage multi-purpose management of forestland**.** Ideally, the plan-development process enables owners to identify their several purposes and then to choose management practices that are complementary rather than conflicting. For example, an owner interested in improving both long-term income from harvesting and the quality of habitat for certain kinds of wildlife would agree to thin and harvest trees in ways that achieved both purposes.

Table 3.12. Percentages of surveyed owners who had begun to carry out activities recommended in their Forest Stewardship Plans for at least two and three separate management purposes.* By region

Had begun to carry out at least one activity for:	Pacific State %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
At least two purposes	55	64	68	60	63
At least three purposes	31	38	42	32	36
Total Respondents	(305)	(275)	(305)	(353)	(1,220)

*See the separate managerial purposes listed for Table 3.2.

Table 3.13 presents per region the three most common combinations of management purposes that individual surveyed owners reportedly were carrying out. In *all* regions, the most frequent combination involved (1) some recommended activity or activities in the category, "growing trees or caring for their health," plus (2) some activities with the purpose of "improving or preserving your forestland as habitat for wildlife." Across the four regions from 43% to 56% of the total surveyed owners reported implementing one or more activities in both of these categories. The combination of growing/caring for trees and improving water quality ranked second or third in three regions (Pacific, Mountains/Plains states, and South). Combinations involving harvesting/marketing ranked second and third in the North and third in the Pacific States.

Table 3.13. Progress in achieving the program's multi-purpose approach to managing forestland: The three most frequent combinations of management purposes (with percentages) that individual surveyed owners reported they had begun to carry out. By region

	Pacific States	Mountain and Plains States	Southern States	Northern States
First most frequent	Growing/caring for trees and improving wildlife habitat (43%)	Growing/caring for trees and improving wildlife habitat (43%)	Growing/caring for trees and improving wildlife habitat (56%)	Growing/caring for trees and improving wildlife habitat (44%)
Second most	Growing/caring for trees and improving water quality (23%)	Growing/caring for trees and applying agroforestry practices (32%)	Improving wildlife habitat and improving water quality (31%)	Growing/caring for trees and harvesting/marketing trees (26%)
Third most	Growing/caring for trees and harvesting/marketing (22%)	Growing/caring for trees and improving water quality (23%)	Growing/caring for trees and improving water quality (30%)	Harvesting/marketing trees and improving wildlife habitat (24%)
Total respondents	305	275	305	353

Participants Spent Money on Plan Implementation.

Another kind of positive behavioral response from the clients of technical assistance programs is their expenditure of money to implement the given advice. Although the unpaid labor of owners, family, and friends may be all that is needed for some forestry practices (e.g., thinning or pruning), other practices (like seeding, spraying, and fencing) require paid inputs. Across the four regions from 67% to 77% of the surveyed owners reported expenditures for which they did not expect to be reimbursed (Table 3.14).[21] The estimated percentage for the weighted national sample was 69%. As with our findings about the percentage of respondents who reported having started to implement their Forest Stewardship Plans, we need to adjust this important percentage about expenditures for possible overstatement due to nonresponse. Following the conservative procedures introduced at the start of this chapter for dealing with that kind of error, as well as adjusting for potential sampling error, we calculate that there is a 95 in 100 likelihood that at least 48% of the national sample had expended money for which they did not expect to be reimbursed.[22] The actual value is probably much closer to 69%, but we are highly confident that if all program participants were somehow surveyed, at least 48% of them would report such expenditures.

Table 3.14 reports also the percentages of respondents who said that they had spent at least $500, $1,000, $5,000, or $10,000 that would not be reimbursed. Across the four regional samples 33% in the Northern states to 60% in the Mountains and Plains states reported having expended $1,000 or more. The corresponding percentages for $5,000 or more were 10% in the Northern States to 27% in the Pacific States.

To facilitate comparisons among types of surveyed owners, we converted the findings on these categories of expenditures (e.g., at least $500) into average expenditures by using the midpoint in each grouping. For example, the owners who reported spending from $500 to less than $1,000 were assumed to have paid out $750, those in the $1,000 to $4999 group to have spent $3,000, and so on. According to this method of conversion, the unreimbursed spending among all surveyed program participants averaged from $1,827 (Northern States) to $3,616 (Pacific States—Table 3.15). The corresponding estimate for the weighted national sample was $2,764. In developing the regional and national-level estimates, we made the conservative assumption that no money had been spent by the approximately ten percent of our total surveyed owners who were drop-outs from the program.

[21] These percentages are conservative because they are based on all surveyed owners, including those who told us that they had dropped out of the program. Some of the latter may have made unreimbursed expenditures before they left the program. However, since our interviews with them rarely progressed beyond the report that they had dropped out, we did not acquire information about expenditures on whatever plan implementation may have occurred.

[22] For an explanation of the steps used in arriving at this adjusted estimate, see footnote 1 of the chapter.

Table 3.14. Percentages of respondents reporting that in carrying out recommended activities they had spent money for which they would not be reimbursed, and the amounts of such money spent:* By region

Level of Expenditure	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
No, had spent no money that would not be reimbursed (or not sure or inactive)	18	12	16	26	21
Yes, had spent some such money.	70	77	73	67	69
Reported that had spent less than $500	8	16	14	17	16
Had spent at least $500	59	60	56	47	52
Had spent at least $1,000	52	45	49	33	40
Had spent at least $5,000	27	12	26	10	17
Had spent at least $10,000	15	5	14	5	8
Total Respondents	(305)	(275)	(305)	(353)	(1,220)

***Text of question**s: "To carry out activities recommended in your Forest Stewardship Plan, have you spent any money for which you will not be reimbursed?" "About how much money, total, have you spent so far for which you will not be reimbursed?"

Since it seemed likely that much of the unreimbursed money represented the owners' shares of public cost-sharing program for the application of recommended practices, we compared the expenditures of owners who reported participation in such programs to those respondents saying they had not taken part. Participation did make statistically and practically significant differences in three of the four regions. For example, cost-share participants in our Pacific States' sample reported an estimated average of $5,250 that would not be paid back to them, which was 2.6 times the size of the average for surveyed nonparticipants in those states, $2,035 (compare Table 3.15's data lines 2 and 3). In the Southern and Northern states, the differences between these two groups varied by significant factors of 1.9 and 3.6, respectively, while in the Mountains/Plains states, it was an insignificant 1.2. [23]

These differences are not surprising. As owners responded to the incentive of one or more government dollars for every dollar they spent, the total paid out by the cost-share clients tended to be higher than what the non-subsidized owners spent. The surprise might be in the average amounts of money reported by the non-cost-share respondents. Their money investments ranged from a low of $806 per owner in the North to $2,606 in the South (Table 3.15's line 3). Cost-

[23] Statistical significance was determined in an independent sample *t* test at the .05 level.

sharing helped, but apparently was not indispensable to significant expenditures for implementing the FSP plans.

Table 3.15. Average unreimbursed expenditures in dollars reported by FSP participants for implementing their plans: for all respondents, for those with and for those without cost-sharing assistance. By region (and number of respondents for each value in parenthesis)

Type of Expenditure	Pacific States	Mountain & Plains States	Southern States	Northern States	Weighted national sample
1. Average per respondent	$3616 (305)	$2295 (275)	$3420 (305)	$1827 (353)	$2764 (1,220)
2. Average per respondent who received some cost-sharing assistance	$5250 (166)	$2753 (158)	$5079 (133)	$2864 (185)	$3642 (612)
3. Average per respondent who did not receive cost-sharing	$2035 (101)	$2238 (85)	$2606 (141)	$806 (143)	$1589 (501)
4. Average number of acres covered by FSP plans among all respondents who reported that acreage	331.3 acres	371.8 acres	236.6 acres	145.9 acres	214.3 acres
5. "Conservative" estimate of average expenditure per acre, that is, the value in data line 3 divided by the value in data line 4.	$15.50	$6.02	$11.01	$5.53	$7.41
6. Estimates of per acre cost to USDA for preparing FSP plans*	$1.92	$4.79	$7.84	$4.82	$5.30
7. Ratio of estimated average unreimbursed expenditure per acre by assisted owner to estimated federal cost per acre (line 5 divided by line 6)	8.1	1.3	1.4	1.1	1.4

***Source:** U.S. Forest Service. The estimate for the Pacific States is the weighted average of the cost per acre for that region's three states for which we had cost data, Alaska, Washington, and Oregon, plus an imputed value for California, which was the highest value for the three Pacific states for which data were available. The weight for each state's average was its share of the total number of acres with plans across the four states for the fiscal years 1991-1997. The estimate for the Mountains and Plains states was the weighted average of the cost per planned acre for Idaho, Montana, and North Dakota, with the weighting factor per state being its share of the region's total acres under plans for FYs 1991-1997.The value for the Southern States was derived from region-wide data on costs relative to acres planned, FY 1990-1998. The value for the Northern States was also a region-wide average. The national figure represents an average of the four regional estimates, with each of the latter weighted by its share of the total number of planned acres, FY 1991-1997.

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Cost-Effectiveness as Measured by Ratio of Leveraged Expenditures to USDA's Cost for Preparation for Forest Stewardship Plans

These estimates of client expenditures permit an analysis of the cost-effectiveness of the Forest Stewardship Program according to one important *intermediate* criterion of program success—whether public spending has been matched by an equal amount of private spending for the same purposes. Adequate measuring of the FSP's *ultimate* purposes—such as increasing the harvesting of mature trees and improving water quality—must wait until trees planted under the program mature and bodies of water respond, perhaps rather slowly, to remedial management practices. However, the survey data gathered in 1998-99 about unreimbursed owner expenditures suggest that already the participating owners have spent, on average, more of their

own money on plan implementation per acre than the average cost to the federal government of preparing the plans per acre.

To arrive at this finding we obtained from the USDA Forest Service, for all four regions, estimates of the FSP's cost per acre to the U.S. Department of Agriculture. Based on both the dollars allocated to the state agencies that delivered the program and the dollars representing USDA's own administrative overhead, those estimates ranged from only $1.92 in the Pacific states, which include Alaska with its large-acre plans, to $7.84 per acre in the Southern region (see data line 6 in Table 3.15). Costs per acre tend to be lower where the properties being assisted are large.

For the owner-expenditure component of the ratio, we chose the average unreimbursed expenditure per acre by owners who did *not* participate in cost-share programs. Their spending should not have mixed in it their contributions to such programs, and that is the kind of expenditure we needed since our $1.92 to $7.84 estimates of federal cost per acre did not include any of the grants for cost-sharing programs. To arrive at the owner's spending per acre, we used the regional average number of planned acres derived from *all* surveyed owners (line 4 of Table 3.15). If, instead, we had employed the average for non-participants in cost-sharing, we would have inflated the spending figure because the non-participants tended to have fewer acres under plans. Our estimates of unreimbursed spending ranged from $5.53 per acre in the Northern states to $15.50 in the Pacific region, and they exceeded the average federal costs per acre by factors of 1.1 to 8.1 (see the ratios in data line 7 of Table 3.15). In summary, if we use the evaluative criterion of whether or not assisted owners had invested "significant" money on carrying out their plans, and we apply to that criterion the standard of whether the owners spent as much money on plan implementation as the federal government did for plan preparation, the FSP has succeeded.[24]

The Effects of Assistance in Addition to Preparation of the Stewardship Plans

Most of the surveyed owners received one of two kinds of public-sector aid for managing their forestland that was in addition to, and complementary to, the Forest Stewardship plans: cost-sharing for particular practices recommended in the plans and follow-up technical assistance for implementing those practices or others listed in the plans. For example, the federally funded Stewardship Incentive Program (SIP) cost-shared a number of approved general practices, including "Reforestation and Afforestation," "Soil and Water Protection and Improvement," and "Wildlife Habitat Enhancement" (USDA Forest Service 1999). Owners were eligible for SIP money only if they had an approved Forest Stewardship Plan. Across the four regions from 44% to 58% of all respondents reported having received "cost-sharing money from a public agency to help pay for part of the cost of recommended activities for carrying out . . . [their] Stewardship

[24] We do not have equivalent data for the state governments' costs.

plan" (Table 3.16). Forty-two percent to 58% said that they had obtained "follow-up technical assistance in the sense of some [public-agency] specialist in forest management having visited your land after the Stewardship Plan was approved to give you advice on how to carry out your Plan's recommendations" (Table 3.16). Fifty-nine percent to 73% reported having had one or the other type of aid.

Table 3.16. Percentage of surveyed respondents who reported receiving cost-sharing or follow-up technical assistance from public agencies: By region

Type of Assistance	Pacific States %	Mountain & Plains States %	Southern States %	Northern States %	Weighted national sample %
Cost-share assistance (federal and/or state)*	54	58	44	52	50
Follow-up technical assistance**	42	58	44	54	51
Either cost-share or technical assistance	66	73	59	68	66
Total respondents	(305)	(275)	(305)	(353)	(1,220)

***Text of question:** "Have you received any cost-sharing money from a public agency to help pay for part of the cost of recommended activities for carrying out your Stewardship plan?"

****Text of question: "**Have you received any follow-up technical assistance in the sense of some specialist in forest management having visited your land after the Stewardship Plan was approved to give you advice on how to carry out your Plan's recommendations?" A further question determined if this kind of assistance came from a public rather than a private agency.

Table 3.17. Among surveyed owners who reported having started to implement their FSP plans, the percentages who received cost-sharing or follow-up technical assistance from public agencies: By region

Type of Assistance	Pacific States %	Mountain & Plains States %	Southern States %	Northern States %
1. Cost-sharing) assistance (federal and/or state)*	66	67	52	59
2. (Had not received cost-sharing assistance)	(34)	(33)	(48)	(41)
3. Follow-up technical assistance**	59	70	60	70
4. (Had not received technical assistance)	(41)	(30)	(40)	(30)
5. Either cost-sharing or technical assistance	81	86	75	80
6. (Had not received either type of assistance)	(19)	(14)	(25)	(20)
Total respondents who had started to implement	(247)	(228)	(248)	(303)

When we restrict the analysis to surveyed owners who had started to implement their Forest Stewardship Plans, these percentages increase (Table 3.17). However, many participants– 33% in the Mountains/Plains states to 48% in the Southern States--had begun to carry out their plans' recommendations *without* cost-sharing; and from 30% to 41% without follow-up technical assistance (see data lines 2 and 4 of Table 3.17). In other words, assistance in addition to the help in developing plans was not essential.

Though not necessary, complementary assistance may have nevertheless made important differences in the implementation behavior of FSP participants. We address that issue in two ways. First, the survey instrument included questions that directly asked the aid recipients to

evaluate the effect of both kinds of assistance: "Looking at what you have done so far in carrying out the activities recommended in your Stewardship Plan, would you have done as much if you had not received the follow-up technical assistance [or "that amount of cost-sharing money"]?" Across the four regions from 52% (in the Pacific States) to 70% (Northern States) answered "no" to the cost-sharing question (Table 3.18), that is, the money was needed. The responses for the technical assistance question were similar. From 52% of the assisted owners (in the Pacific States) to 71% (in the Northern States) reported that the follow-up technical help was necessary to the progress that had been made (Table 3.19).

Table 3.18. Respondents' assessments of effect of cost-sharing on plan implementation: Percentages selecting different response options by region

Question: Would have done as much plan implementation if had *not* received the amount of cost-sharing received?	**Pacific States %**	**Mountain & Plains States %**	**Southern States %**	**Northern States %**	**Weighted national sample %**
Yes	35	30	24	19	22
Maybe	11	14	13	8	10
No	52	53	60	70	65
Don't know or won't say	2	3	3	3	3
Total respondents who received cost-sharing	(127)	(158)	(136)	(192)	(618)

Table 3.19. Respondents' assessments of effect of follow-up technical assistance on plan implementation: Percentages selecting different response options by region

Question: Would have done as much plan implementation if had *not* received the follow-up technical assistance?	**Pacific States %**	**Mountain & Plains States %**	**Southern States %**	**Northern States %**	**Weighted national sample %**
Yes	36	31	23	17	21
Maybe	9	14	13	9	10
No	52	54	61	71	66
Don't know or won't say	3	1	3	3	3
Total respondents who received technical aid	(150)	(166)	(154)	(218)	(698)

Since some responses about the effects of aid may have been generated by feelings of gratitude, we looked for other evidence of the same effects. Using multiple regression analysis, we tested whether receipt of both kinds of aid was associated with higher implementation effort. Our measure of effort is the reported amount of unreimbursed money spent on carrying out activities recommended in the FSP plans. The regression analysis found that receipt of cost sharing money was indeed associated with higher spending. With nine other hypothesized causal variables held statistically constant in the equation, the respondents who reported such assistance averaged an estimated $1,741 more in unreimbursed expenditures on plan implementation than those owners who had not participated in cost-sharing. The regression equation yielded this rather high estimate even with likely competing causal variables taken into account (or "controlled" for): the number of acres covered by the FS plan, the time elapsed since the plan was received, and the respondent's annual income (see Table 1 in the Appendix to this report).

The relationship between spending and receipt of technical aid was also positive, but not strong enough to be statistically significant. However, when we used instead the variable, "yes/no," the

technical assistance was rated "highly useful," a moderately strong, statistically significant association emerged. With the equation's other causal variables held constant, owners who received technical aid that they rated "highly useful" spent on average an estimated $504 more dollars than respondents not in that category (Table 1 of the Appendix).

Summary

According to the survey findings in this chapter, large majorities of Forest Stewardship Program participants in all four regions had begun to implement their plans. When those who had not started a component of their plans (e.g., tree harvesting, protection of water quality) were asked to explain their inaction, very few of these respondents attributed it to poorly drafted FSP plans or inadequate follow-up technical aid. And relatively few attributed it to lack of money. In all regions also, the plan-implementation efforts of most surveyed owners amounted to a multi-purpose approach to managing their forestland. That is, they were carrying out activities with at least two separate purposes.

The FS program stimulated participating owners to spend significant unreimbursed sums for plan implementation. We estimated that in all regions the average sum spent per acre by owners exceeded the average federal government cost per acre for developing the FSP plans. Regression analysis indicates that the amount of owner spending was positively associated with whether the owner had received cost sharing funds and with his/her perceptions of the quality of follow-up technical assistance obtained. Across all regions majorities of the respondents reported that either they had participated in a cost-sharing program that was complementary to the FSP or they had received follow-up technical assistance. Majorities of the surveyed recipients of both kinds of aid judged that the help they obtained was necessary for the extent of plan implementation they had achieved. In other words, we found two kinds of evidence that these two types of complementary assistance were effective.

Chapter 4

Evidence that the Forest Stewardship Program Changes Management Behavior and Intentions

Introduction

Continuing the discussion of plan implementation begun in Chapter 3, this chapter focuses on managerial activity that surveyed forestland owners said was new to them. A related second focus is on changes in managerial intentions that appear to be related to the respondents' participation in the Forest Stewardship Program (FSP). Although the FSP may be judged a success for encouraging clients to continue appropriate practices that they had begun before receiving the program's assistance, there is the possibility that clients would have continued even without the program. Therefore, evidence of new activity or different intentions may be considered stronger indicators of success

Our study found evidence of three kinds of changes in managerial behavior and/or intentions by significant percentages of the surveyed owners: they reported (1) applying practices that they had never used before, (2) employing management information sources that were new to them, and (3), compared to before they obtained their plans, being more likely to pursue selected goals for their land (e.g., "harvest timber for selling," "improve wildlife habitat," "improve or preserve water quality," "and "apply a practice for recreational or aesthetic purposes"). The full reasons for these reported changes doubtless include factors other than participation in the FSP. However, our analyses of the responses suggest that the FSP was indeed one causal factor.

(1) Management Activities Being Carried Out that Were New to the Surveyed Owner

The Forest Stewardship Program appears to have changed behavior in the sense of helping owners to carry out management activities that were new to them. Across the four regions 52% to 56% of the surveyed owners answered, "yes," there was one or more activities recommended in their FSP plans that they had started to carry out and that were "new to you, that is, an activity that you had never done before" (Table 4.1). Figure 4.1 illustrates the striking similarities in the regions' percentages on this measure. The corresponding estimate for the weighted national sample is 55%. Per region 28% to 34% reported that they had begun applying new activities in at least two different categories of management purposes (such as growing/caring for trees and improving wildlife habitat).

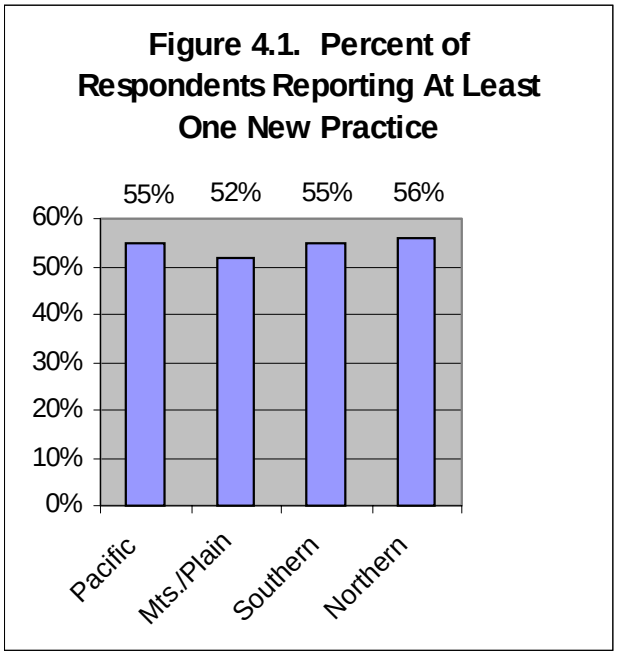
It seems unlikely that owners would fabricate a "yes" answer of this type. For respondents worried about how socially desirable their answers sounded, continuing to apply good practices

Table 4.1. New management activities implemented: Percentages of surveyed owners reporting they had carried out at least one management activity that they "had not done before" in at least one, two, and three different categories of management purposes

	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
*Started at least one activity that was new	55	52	55	56	55
**At least one that was new in two or more categories of purposes	29	34	32	28	30
**At least one in three or more categories of purposes	14	15	16	11	13
Total respondents	(305)	(275)	(305)	(353)	(1,220)

*"New to you, that is, an activity that you had never done before."

**Management purposes given in the survey: "Growing or caring for trees," "Harvesting or marketing trees," "Improving or preserving forestland as wildlife habitat," "Improving or preserving the quality of water resources," "Agro-forestry activities," and "Other."



from the past was likely to seem better than admitting that they had just recently begun to use the practices. As discussed in Chapter 3, another possible source of overstatement is nonresponse error. If again (as in Chapter 3) we adopt the very conservative assumption that all the nonrespondents did not engage in the desired managerial behavior (in this case, applying new practices), we are 95% confident that at least 37% of all FSP program participants would report a

new activity if we somehow were able to survey all of them.[25] The actual percentage is probably much closer to our sample finding of 55%.

There was, of course, the possibility that owners would have adopted new practices without the Forest Stewardship Program. They might have decided to use the practices before they signed up for the program and then included in their FSP plans what they already intended to do. To prove or disprove this possibility with high confidence, we would have needed two random samples: the one of program participants that we did create and survey and a second, consisting of nonparticipants, randomly selected from all NIPF owners who had not enrolled in the FSP. Resources of time and money were too limited to develop the second sample.

Therefore, we must look for another type of evidence of program effect rather than through comparisons between the behaviors of program clients and nonclients. Our alternative approach was to use regression analysis to establish whether aspects of actual program participation were associated with using new practices. Such evidence at least indicates that the program facilitated adoption, if not being a necessary cause of it. We found three relevant associations through logistic regression, an analytical technique for explaining "yes/no" questions (Hosmer and Lemeshow 1989), which in our case, was whether a surveyed owner had applied at least one plan-recommended management activity that was new to him/her. Owners were more likely[26] to report a new activity if:

- they had received follow-up technical assistance,
- they had participated in a cost-sharing program, or
- they had a relatively high ratio of acres under a plan to total forestland owned, among other traits (see Table 4b in the Appendix to this report).

The complementary technical and monetary aids are obvious facilitators. Having high ratios of planned acres to total acres of forestland may mean a greater acceptance of the objectives or spirit of the Forest Stewardship Program, including perhaps an openness to trying new activities.

[25] The 37% estimate was derived in the following way. We add all the nonrespondents in the weighted national sample, 474, to the 1,220 respondents. The sum of those two values, 1,694, becomes the new base for calculating the unadjusted percentage of FSP clients who reported that they had started implementing their plans. Dividing 1,694 by the number of respondents who said they had begun, 671 yields 39.6%. Then we account for sampling error by estimating the 95% confidence interval for a sample of 1,694 where the population from which the sample was drawn numbered 61,734 and the sample finding was 39.6%. That interval is plus or minus 2.4 percentage points.

[26] "More likely" is defined as there being a greater likelihood or odds that the indicated type of respondent (e.g., an owner who received follow-up technical assistance) was in the indicated outcome category (e.g., being a respondent who had started to carry out a recommended activity that was new to him or her). For example, logistic regression estimated that the odds of carrying out a new activity increased by a factor of about 1.6 when respondents were technical-assistance recipients rather than non-recipients, other variables in the equation held statistically constant.

We do not mean to imply that receipt of technical assistance or cost-sharing were necessary conditions for innovation. However, as Table 4.2 indicates, compared to non-participants in those two complementary–to-FSP programs, participants were more likely to have reported management activities that were new to them. For example, in the weighted national sample, while 67% of the respondents with follow-up technical assistance said that they had started to implement at least one new activity in their FSP plans, the corresponding percentage among surveyed owners who had *not* received such assistance was 18 percentage points lower (49%). The percentage-point spread was very similar when recipients of cost-sharing were compared to non-recipients—68% versus 51% (Table 4.2). These findings, along with the logistic regression analysis presented in Table 4b of the Appendix, indicate that for many owners a management plan is not enough to induce them to apply new practices; also required may be complementary cost-sharing and/or follow-up technical assistance. Returning to this issue in Chapter 5, we discuss the relative importance of cost-sharing and technical assistance in bringing about three types of desired managerial behaviors: adopting new practices, as well as starting to carrying out plans and spending unreimbursed funds on plan implementation

Table 4.2. Relationship of participation in complementary assistance programs and report of at least one new management activity being carried out: Percentages of surveyed landowners by region

Categories of Surveyed Owners	Pacific States %	Mountain & Plains States %	Southern States %	Northern States %	Weighted National Sample %
Among those who received **follow-up technical assistance**, percent who reported at least one new management activity	70% of 150	66% of 165	66% of 154	67% of 218	67% of 697
Among those who *did not* receive such **technical assistance**, percent who reported at least one new activity	53% of 122	43% of 80	56% of 120	43% of 113	49% of 423
Among those who received **cost-sharing assistance**, percent who reported at least one new management activity	66% of 110	63% of 158	67% of 133	69% of 185	68% of 612
Among those who *did not* receive **cost-sharing**, percent who reported at least one new activity	56% of 106	51% of 87	56% of 141	47% of 146	51% of 500

Types of New Management Activities Reported by Surveyed Owners

Table 4.3 presents, by type of management purpose, the percentages of total respondents who reported carrying out activities that were new to them. The magnitudes of these percentages are determined in part by the proportions of respondents who had started to apply the kind of management activity in question. For example, across the four regions relatively few owners—8% to 18%--said that harvesting or marketing activities were new to them. These percentages are small mainly because only 15% to 38% percent of the total respondents per region had started to

carry out any activity with that purpose (see Table 4.3's percentages in parentheses). For the opposite reason, many more owners reported new activities in the categories, "growing/caring for trees" and improving wildlife habitat." The table suggests that, across the four regions, the FS Program had helped 35% to 46% of the total respondents to apply new activities in the former category, and from 26% to 34% were introduced to practices for improving wildlife habitat.

Table 4.3. Percentages of total surveyed owners who carried out *new* management activities, by type of management purpose and by region, with the percentages who had started any activity, new or old, of that type given in parentheses

	Pacific States %	Mountains & Plains States %	Southern States %	Northern States %	Weighted National Sample %
Harvesting/marketing	11 (24)	8 (15)	13 (27)	18 (38)	15 (31)
Growing/caring for trees	46 (77)	35 (70)	40 (69)	37 (65)	38 (68)
Improving wildlife habitat	26 (45)	30 (52)	34 (66)	26 (56)	29 (58)
Improving water quality	14 (24)	13 (25)	16 (34)	10 (20)	12 (25)
Agroforestry activities	5 (9)	19 (38)	3 (6)	4 (8)	5 (10)
Total respondents	(305)	(275)	(305)	(353)	(1,220)

Tables 4.4 through 4.7 present, per type of management purpose, the three most frequently mentioned activities that had been started *and* that were new to them. Across all four regions, "planting trees" and "thinning or marking trees for thinning" ranked first or second under the management purpose, "growing and caring for trees" (Table 4.4). From 9% to as many as 27% of all respondents with plans reported that one or the other of these two kinds of implemented activities were new to them. The group of practices labeled "clipping, trimming, and pruning" ranked third in two regions.

Table 4.4. Three most frequently reported activities for "Growing or Caring for Trees" that had been started *and* were new to the owners: Percentage of respondents reporting each activity, by region

Management Purpose and Kind of Activity	Pacific States		Mountains and Plains States		Southern States		Northern States		Weighted National Sample	
Growing or Caring for Trees	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Planting	1st	27	2nd	9	1st	16	2nd	14	2	15
Thinning or marking trees for thinning	2nd	18	1st	10	2nd	12	1st	17	1	16
Clipping, trimming, pruning	3rd	7	3rd	4	--	--	--	--	5	1
Fire breaks	--	--	--	--	3rd	7	1st	7	4	6
Weeding, mowing, spraying for weeds	--	--	--	--	--	--	3rd	5	3	7
Total respondents with active plans	--	272	--	245	--	274	--	331	--	1,120

Table 4.5. Three most frequently reported activities for "Improving or preserving wildlife habitat" that had been started *and* were new to the owners: % of respondents reporting each activity by region

Management Purpose and Kind of Activity	Pacific States		Mountains and Plains States		Southern States		Northern States		Weighted National Sample	
Improving/Preserving Wildlife Habitat	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Keep or develop natural shelter (e.g., leaves, slash, brush)	1st	6	2nd	4	--	--	2nd	7	3	5
Planting trees or grass or improving tree stands	3rd	3	1st	7	2nd-	9	1st	9	2	9
Creating or preserving food plots and other food sources	2nd	4	--	--	1st	11	3rd	6	1	13
Creating or protecting water habitat (lakes, ponds, streams)	1st	6	--	--	3rd	4	--	--	5	2
Man-made shelters (e.g., bird houses)	1st	6	--	--	--	--	--	--	6	1
Thinning	--	--	3rd	4	--	--	--		4	3
Total respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)	--	1,120

Among the implemented activities reported to be new under the management purpose, "Improving or preserving wildlife habitat," the group of activities labeled "keep or develop natural shelter (e.g., leaves, slash, brush)" ranked first or second in three regions (Table 4.5). "Planting trees/grass or improving tree stands" was first in two regions and second or third in the others. The percentages of total respondents associated with these rankings are small—3% to 9%--in part because of the great variety of separate wildlife-related activities reported by the surveyed owners, compared to the total percentages of respondents per region who reported any new practice of that general type (Table 4.3).

Tables 4.6 and 4.7 present the reported kinds of implemented activities for the two management purposes, "harvesting or marketing of trees" and "improving or preserving the quality of water resources." As with our findings about wildlife habitat, the specific activities were too varied for even the first or second most frequently reported type to account for more than 11% of all respondents in a region with an active plan.

Table 4.6. Three most frequently reported activities for "Harvesting or marketing trees" that had been started *and* were new to the owners. Percentage of respondents reporting each activity, by region										
Management Purpose and Kind of Activity	**Pacific States**		**Mountains and Plains States**		**Southern States**		**Northern States**		**Weighted National Sample**	
Harvesting or Marketing Trees	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Cutting, logging, or harvesting	1st	7	1st	4	1st	7	1st	11	2	9
Thinning including not for sale	2nd	4	--	--	2nd	3	--		4	1
Selling, marketing, taking bids	3rd	3	2nd	2	--	--	2nd	6	1	10
Marking and tagging for harvest	--	--	3rd	2	2nd	4	3rd	2	3	3
Total respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)	--	1,120

This series of tables about activities new to owners does not include one focusing on agro-forestry practices because significant numbers of respondents reported them only for the Mountains and Plains states. There the only practice mentioned by more than a trivial percentage of surveyed owners were windbreaks. Seventeen percent of the respondents with active FSP plans in that region reported that installing windbreaks was new to them.

Table 4.7. Three most frequently reported activities for "Improving or preserving the quality of water resources" that had been started *and* were new to the owners. Percentage of respondents reporting each activity by region										
Management Purpose and Kind of Activity	**Pacific States**		**Mountains and Plains States**		**Southern States**		**Northern States**		**Weighted National Sample**	
Improving/preserving Quality of Water Resources	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**	**Rank**	**%**
Erosion control (buffer/filter strips, limited tillage, careful logging, etc.)	1st	5	1st	5	1st	11	1st	7	2	8
General riparian or stream-side management	2nd	5	--	--	--	--	--	--	4	1
Controlling animals, including fencing out livestock	--	--	2nd	4	3rd	2	3rd	1	1	9
Create/protect ponds, wetlands, and other bodies of water	3rd	4	3rd	2	2nd	3	2nd	3	3	3
Total respondents with active plans	--	(272)	--	(245)	--	(274)	--	(331)	--	1,120

The Owner Traits Associated with Planting or Logging/Thinning under the FSP

Among the new activities mentioned most frequently were planting trees and cutting down trees either for logging or thinning purposes. Both of these basic activities were mentioned for more than one purpose. For example, tree planting could serve both to provide wildlife habitat and to be windbreaks that protected crops. Cutting trees could both generate income through logging for commercial sales and improve the long-term health of tree stands through thinning. Across the four regions, from 32% to 37% of the surveyed owners reported that under their FSP plans they were planting trees and that such activity was new to them, "that is, an activity that you had never done before" (Table 4.8). The corresponding range for cutting/thinning was 19% to 26% (Table 4.8). We used logistic regression to determine how respondents for whom planting was a new activity differed from other surveyed owners. The same analytical tool was applied to explain why many surveyed owners said that logging or thinning was a new activity to them.

Table 4.8. Percentages of respondents who, under their Forest Stewardship Program Plans, were planting trees and/or cutting/thinning trees and such activity was new to them, by region

Categories of surveyed owners	Pacific States %	Mountains & Plains States %	Southern States %	Northern States %	Weighted national sample %
Planting trees was new to them.	35	32	34	37	36
Cutting or thinning trees was new to them.	21	19	21	26	24
Total respondents	(305)	(275)	(305)	(353)	(1,220)

According to the regression analysis, participants in the Forest Stewardship Program were more likely to report *planting trees for the first time* if they:

- were retired,
- were women,
- had owned the land under the FSP plan relatively few years,
- had received follow-up technical aid, and
- had *not* received advice from a specialist in forest management before entering the FSP, among additional conditions that differentiated them from other respondents (see Table 5 in the Appendix).

The follow-up assistance probably made it easier for the owners to deal with new activities. The short span of ownership may indicate persons with repertoires of management activities so limited that it was easy to find attractive practices that they had not tried previously. Similarly, the absence of past professional advice suggests owners who failed to plant out of a limited understanding of the benefits of planting or replanting.

Regression analysis indicated that owners were more likely to *log or thin trees for the first time* through their FS plan if:

- they had owned the land under a plan for a comparatively short time,
- the planned acres comprised a relatively large proportion of their total forest land, and
- if their land had a stream or other body of water on or near it (Table 6 in the Appendix).

We tested if underlying the association with surface water was a regional factor. Perhaps relatively more of the respondents who logged or thinned for the first time came from the South with its largely wetter climate. No, the relationship was independent of region. Perhaps having land with surface water indicates a greater capacity to support thick tree growth. Included in the variables that did not help to identify owners for whom planting or logging/thinning was new were age, level of education, income, and whether or not respondents had a self-written plan through the "coached planning" process discussed in Chapter 1.

(2) The Forest Stewardship Program Helped Owners to Obtain New Informational Inputs for Their Management Decisions

The second type of change in owners' management behavior that the survey identified was in the informational inputs that many respondents reported using. Previous studies found that relatively few nonindustrial private forestland owners sought professional assistance for harvesting or other management purposes (Bourke and Luloff 1994; Harmon et al. 1997; Sampson and DeCoster 1997). Among the owners with active FSP plans whom we surveyed in the four regions, only 11% to 22% said that they had subscribed to a "magazine or other information source about managing forestland before you obtained your Forest Stewardship Plan" (Table 4.9). And 26% to 40% reported that they had ever received advice from a forest management specialist before they had signed up for the FS Program (Table 4. 9).

Table 4.9. Among surveyed owners with active plans, comparisons of pre-program and current status regarding subscriptions to printed information about managing their forestland and regarding use of advice from management specialists. Percentages by region*

Categories of surveyed owners	Pacific States %	Mountains & Plains States %	Southern States %	Northern States %	Weighted national sample %
1. Pre-program: Prior to program had **subscribed to a magazine or other printed information source** about managing forest land	20	11	22	15	17
2. Current: Currently **subscribes to a magazine, newsletter, or on-line service** with information about managing forestland	52	27	48	44	45
3. Pre-program: Prior to program had received **advice from a management specialist**	40	26	40	29	33
4. Future: "Very likely" to ask advice from a **"management specialist"** in next 2 years	35	41	52	49	48
Total respondents	(272)	(245)	(274)	(331)	(1,120)

***Texts of relevant questions:** "Did you subscribe to any magazine or other information source about managing forestland before you obtained your Forest Stewardship Plan?"

"Do you currently subscribe to any magazine, newsletter, or on-line service that contains information about managing forest land?"

"Before you signed up for the Forest Stewardship Program, had you ever received advice for managing your

forestland from a specialist in managing forest land?"

"How likely is it that, sometime in the next two years, you will ask advice about your land from a specialist in managing forests? Is it not at all likely, slightly likely, moderately likely, or very likely?"

Ideally, the experience of working with professionals to develop FSP plans persuades most program clients to use professional information sources in the future. In fact, when our samples of owners with active plans were surveyed in 1998 and 1999, their interest in using management information tended to be higher compared to the pre-program status. Across all four regions the percentages of these respondents who subscribed to some print or electronic information source increased by 16 to 32 percentage points (compare data lines 1 and 2 of Table 4.9). Also, except in the Pacific States' sample, there was a parallel increase—12 to 20 percentage points--in the proportions of owners who were "very likely" to ask advice from a management specialist in the next two years, compared to the percentages of respondents who said they had had received such advice pre-program (Table 4.9's data lines 3 and 4).

In cross-tabulation analysis we found that, across the four regions, 21% to 44% of the owners with active plans who had previously *not* subscribed to management-related magazines or like sources told us that they did so currently (see data line 1 of Table 4.10).[27] Similarly, 29% to 48%, who had *not* sought professional advice in the past said in the survey that they were "very likely " to do so in the near future (Table 4.10's data line 2). These findings suggest that the FS Program succeeded in encouraging many participants to obtain new informational inputs for decision-making about their land. Other factors (like more effective marketing of services) may account for the changes, but at least our numbers point to the possibility of positive effects from participation in the Forest Stewardship Program.

[27] There was, of course, the possibility that experience with FSP discouraged the use of print or electronic information for management decisions. We tested that possibility and found that the percentage-point reduction in use among pre-program users was considerably less than the increase among prior non-users except in the Mountain and Plains states. In that regional sample, 21% of the previous non-users said that they were currently subscribing compared to 74% of the prior users.

Table 4.10. Relationship between (a) not using managerial specialists or print and electronic sources of managerial advice and (b) current use of, or intentions to use, such sources: Percentages of surveyed landowners by category and region					
Categories of Surveyed Owners	**Pacific States**	**Mountain & Plains States**	**Southern States**	**Northern States**	**Weighted National Sample**
1. Among the owners who had not subscribed to **a print or electronic source** of managerial information before the FSP, the % who currently subscribe	44% of 213	21% of 216	37% of 207	38% of 276	37% of 908
2. Among owners who had never received a **specialist's advice** before the FSP, the % who were "very likely" to ask for it in the next two years	29% of 153	37% of 180	48% of 154	45% of 227	44% of 721

As with our earlier discussion of the Forest Stewardship Program's apparent positive effect on adopting new management practices, we used logistic regression to find evidence that aspects of participation in the FS program encouraged owners to employ a new source of information for managerial decisions. In the absence of such evidence, use of the source after taking part in the program could have been a coincidence. A total of 320 respondents told us that they were new subscribers to a management-related periodical or on-line source; prior to receiving their FS plan they had not subscribed. The regression analysis found two associations between being new subscribers and participation in the program. Surveyed owners were more likely to have taken out subscriptions for the first time if they: had adopted new practices recommended in their FSP plans and if they thought well enough of their experience with the program to recommend participation in it "strongly" to friends or family members (Table 8 in the Appendix). The experience of following written advice to the point of adopting new practices may have inclined owners to seek the kind of written information readily available through periodicals. The presumably positive experiences with the program that underlay a willingness to recommend it strongly may have included an appreciation of the same general kind of information.

(3) The FS Program May Have Changed or Strengthened Owners' Objectives for Their Forestland

A third kind of change that participation in the Forest Stewardship Program seems to have brought about is a modification in owners' objectives for their land. More specifically, the experience of developing and implementing Forest Stewardship plans appears to have caused most of the surveyed participants with active FSP plans to change or strengthen their management goals. For five designated purposes, we asked the question, "When you compare your current thinking about your forestland to your thinking about it before you obtained your Forest Stewardship Plan, what is the likelihood of doing the following activities": harvest timber for selling, improve wildlife habitat, improve or preserve water quality, install agroforestry practices, or apply a practice for recreational or aesthetic purposes.

Across all regions, the purpose of improving wildlife habitat recorded the greatest swing towards it. From 44% to 54% of the owners said they were "more likely" to pursue it compared to their intentions before receiving their FSP plans (Table 4.11). In each region water quality improvement ranked second or third in positive changes. For negative impacts, the purpose of harvesting and selling timber was first or second in the percentages of respondents who reported a lower likelihood. Across the regions, 15% to 34% said that they were less likely to pursue that purpose compared to their intentions before participating in the program (Table 4.11). The remaining respondents told us that they were just as likely as before to follow the objective at issue. Over half (52%) of all the owners who reported being less interested in harvesting tended to say that they were "more likely to improve wildlife habitat." They may have understood that reduced or no logging can result in better habitats for wildlife. There can be a similar connection with improved water quality; 37% of this group of owners said that they were both less likely to harvest and "more likely to apply a practice to preserve or improve water quality."

In four-fifths of Table 4.11's comparisons (those in bold type), the percentage-point swings to being "more likely" were larger than the changes in a negative direction. And across the four regions, from 39% to 46% of the surveyed respondents with active plans were, compared to their pre-plan thinking, both "more likely" to pursue at least one of the five specified management purposes and not "less likely" to follow any of the others (Table 4.11)

Table 4.11. Changes in the owners' thinking about pursuing five forest management purposes: The percentages who reported being "more likely" and "less likely" to pursue a purpose compared to their thinking before receiving a Forest Stewardship Plan. By region among respondents with active plans

	Pacific States %		**Mountains & Plains States %**		**Southern States %**		**Northern States %**		**Weighted National Sample %**	
	More	**Less**	**More**	**Less**	**More**	**Less**	**More**	**Less**	**More**	**Less**
Improving wildlife habitat	**44***	5	**49**	4	**54**	2	**48**	4	**50**	3
Improving or preserving water quality	**35**	3	**32**	8	**41**	7	**32**	7	**35**	7
Harvesting timber for sale	**21**	15	17	34	**28**	18	**33**	16	**29**	18
Installing agroforestry practices	16	18	**31**	11	17	17	17	21	18	19
Applying practices for recreational or aesthetic purposes	**25**	17	**27**	15	**31**	15	**28**	12	**29**	14
(More likely to pursue at least one of the five and not less likely to pursue any other purpose)	(44%)		(39%)		(46%)		(46%)		(45%)	
Total respondents	(272)		(245)		(274)		331		1,120	

*The values in bold type are the cases where the shift to being "more likely" was greater than the shift to "less likely".

Some of the positive changes probably represent owners who wanted their answers to sound

good. Being more willing to protect wildlife habitat or water quality is the socially desirable response in many parts of the country. However, we found evidence of a likely program effect when the answers of the owners who had begun to implement the management purpose in question (e.g., improve water quality) were compared to those who had not started. Among the respondents who had begun to carry out an activity under the purpose in question (e.g., a wildlife habitat activity), higher percentages said that they were "more likely" to pursue that same purpose than they were pre-program. This pattern was found in all the possible comparisons;[28] and in 82 percent of the total pairings, the differences were statistically significant at the .05 level.[29] For example, while 17% of the 199 respondents in the Pacific States who had not begun to implement harvesting-related activities under their FSP plan said that they were "more likely" to "harvest timber for selling than you were before getting a plan," the percentage for the 73 surveyed owners who had started such activities was 34%. The corresponding percentages for agroforestry activities in the Mountains/Plains States were 20% compared to 45%, while the difference in the Southern States regarding water quality activities was 27% among the respondents who had not applied such practices versus 63% among those who had.

Conversely, relatively few of the surveyed owners who had begun to implement activities for a particular management purpose told us that they had become *less* likely to pursue that purpose compared to before joining the program. For the management purpose of improving wildlife habitat, the percentage of owners who had weaker intentions after applying practices with this purpose ranged from zero percent to 2% across the four regions (Table 4.12). The corresponding range for improving/preserving water quality was from zero to 3%. For harvesting timber for sale, the range was wider—from 7% in both the Pacific and Mountain/Plains states to 14% in the North, while for agro-forestry activities it extended from zero percent in the Pacific States to 19% in the North.

[28] We made a total of 16 comparisons—one each regarding harvesting, wildlife habitat, water quality, and agroforestry in each of the four regions. We could make these comparisons because earlier in the interview we had inquired about whether their Forest Stewardship Plans included such purposes and whether they had begun to implement recommended activities under the relevant purposes. For the fifth management intention, recreational activities, we had not previously asked if the FS plan included such a purpose.

[29] In other words, there was a 5% or less chance that the differences were due entirely to variability in the samples.

Table 4.12. Among the owners who had begun to apply recommended activities for a particular management purpose, the percentages who said they were" more likely," " just as likely," and "less likely" to apply practices with the same purpose, compared to before receiving their Forest Stewardship Plans. By type of purpose and by region

	Pacific States %			Mountains & Plains States %			Southern States %			Northern States %		
	More	**Same**	**Less**	**M**	**S**	**L**	**M**	**S**	**L**	**M**	**S**	**L**
Improving wildlife habitat	55	43	0	58	40	1	58	41	1	56	40	2
Improving or preserving water quality	48	52	0	51	48	1	63	36	1	61	36	3
Harvesting timber for sale	34	56	7	38	50	7	40	46	12	38	46	14
Installing agroforestry practices	50	42	0	45	50	4	26	58	11	59	22	19
Total respondents	Totals varied with the purpose											

Summary

In this chapter we presented evidence indicating that participation in the Forest Stewardship Program had changed many participants' ways of managing their land. Across the four regions, from 52% to 56% of all the surveyed owners reported having begun to implement FSP-plan-recommended activities that were new to them. Twenty-one percent to 44% of the many respondents who had not previously subscribed to periodicals about managing their forestland said that they currently did have such subscriptions (either printed or electronic). Among the majority group of owners who had never before sought one-on-one advice from specialists in forest management, 29% to 48% reported that they were "very likely" to do so in the next two years. And across the four regions, 39% to 46% of the surveyed respondents with active plans were, compared to their pre-plan thinking, both "more likely" to pursue at least one of the five specified management purposes and not "less likely" to follow any of the others.

The time limitations of our telephone survey prevented us gathering enough data to test with high confidence the extent to which all these apparently positive effects of the Forest Stewardship Program were attributable to it as opposed to other causes. However, cross-tabulations indicated that participation in the FS program helped to increase the present likelihood of owners pursuing four selected management purposes (harvesting for sale, improving wildlife habitat, preserving water quality, and applying agroforestry practices). And when we conducted regression analysis of who implemented at least one new activity under their plans, as well as separate analyses of first-timers for planting trees and logging/thinning, we found associations that indicate causal ties to the program. New practices were more likely in the presence of follow-up technical assistance, with the receipt of cost-sharing to help pay for plan implementation, and with the owners having large parts of their total forestland under FSP plans. Chapter 5 discusses the

policy implications of these and other findings.

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Chapter 5

Policy Inferences

Introduction

This chapter draws policy inferences from findings presented in previous chapters, as well as from survey data not yet discussed. Earlier chapters focused on the clients' reported extent of plan implementation and of changes in managing their forestland. Here we relate the reported behavior to the same owners' attitudes about various aspects of the Forest Stewardship Program (FSP). We are looking for program features that, according to the participants, may need improvement and that, according to the survey data, correlate with plan implementation and innovation. In other words, we want to know if such improvement is likely to yield positive management behaviors. Of course, positive attitudes towards the program can be highly important irrespective of behaviors. Participants who praise the program may help in mobilizing needed political support, as well as in recruiting new participants.

Our efforts to mine the survey for policy-useful insights are organized mainly around five policy questions that the survey directly addressed and a sixth that can be answered indirectly.

- Did the program clients find their Forest Stewardship Plans easy to understand?
- Did they find the required paper work to be burdensome?
- How willing were they to recommend the program to friends or family members?
- Were participants who wrote their own plans pleased with the products?
- Were clients who obtained follow-up technical assistance satisfied with that aid?
- Were the owners who gave strongly positive responses to any of the preceding five questions more likely to report positive managerial behaviors?

Specifically, we use regression analysis to determine whether, compared to surveyed owners with negative or moderate attitudes, respondents with very positive views were more likely:

(1) to have started to implement their FSP plans,

(2) to have spent relatively high amounts of their own money on plan implementation,

(3) to have carried out a multi-purpose approach to managing their forestland in the sense of having begun to use practices recommended for at least two separate purposes (e.g., caring for the health of trees and improving wildlife habitat), and

(4) to have applied to their forestland at least one practice recommended in their plans that was *new* to them.

We conclude the chapter with a discussion of the survey's findings about the importance of cost-sharing aid and follow-up technical assistance in promoting these four kinds of desirable managerial behavior.

Chapter 5: Policy Inferences

Success of Program's Outreach

The chapter begins with a brief review of the survey's findings about the success of the Forest Stewardship's outreach efforts. As discussed in Chapter 2, the program enrolled mostly the kinds of forestland owners that it was supposed to attract. Across the four regions from 57% to 73% of the surveyed participants said that they had never before received technical assistance for managing their forestland (Table 2.15). The racial composition of our respondents, however, seemed too homogeneous. While a 1978 national study of NIPF owners found African Americans to constitute almost 5% of the total surveyed owners, ours had less than a half of one percent African American (0.4%) and approximately the same very small percentage for Hispanic Americans (0.3%--see Table 2.5). The disparity may be due entirely to sampling error or to changes in ownership since 1978. But there is also the possibility that through more vigorous outreach efforts, substantially more non-white owners could now be enrolled in the FSP.

Reported Ease of Understanding Forest Stewardship Plans and of Doing Required Paperwork

Clients of technical assistance programs may be deterred from active or full participation by paperwork they perceive to be burdensome. And we hypothesized that it was unlikely that program clients effectively implement written plans they find difficult to understand. One of the first questions asked in our survey of FSP participants was: "Overall, has it been very easy, easy, difficult, or very difficult to understand your Stewardship Plan?" Among the surveyed owners with active plans, only 4% (in the Northern States) to 8% (in both the Pacific and Southern regions) chose the "difficult" or "very difficult" response options (Table 5.1). In all regions close to a third selected "very easy," and around 60% answered that it was "easy" to understand their FSP plans. It looks as there is not too much room for improvement.

However, did these positive assessments translate into better managerial behavior? Since overall only 5% of the surveyed owners found their plans to be "difficult" or "very difficult" to understand (Table 5.1), we divided the sample into the approximate third who said the plans were "very easy" to comprehend and compared them to all other respondents (i.e., those who answered "easy," "difficult," and "very difficult"). Although owners in the former group were more likely to have begun to implement their plans, the difference was not statistically significant.[30] Curiously, the surveyed owners who answered "very easy" to understand spent somewhat less of their own money on carrying out plans (an estimated $428 less on average--see Appendix Table 1). They were also somewhat less likely to have started implementing a practice that was new to them (by an estimated factor of .75--see the Appendix Table 4b).[31]

[30] By "statistically significant," we mean that there is less than a 0.1 chance that the regression coefficient estimated through logistic regression is actually zero in the populations from which the sample was drawn.

[31] We tried regression analysis to identify likely reasons for these anomalies, but no plausible explanations emerged.

Table 5.1. Among the surveyed owners with active plans, perceptions of the ease of understanding their Forest Stewardship Plans. By region*					
Response Option	**Pacific States %**	**Mountains and Plains States %**	**Southern States %**	**Northern States %**	**Weighted National Sample %**
Very easy	32	31	34	31	32
Easy	58	62	56	64	61
Difficult	6	6	6	3	4
Very difficult	2	0	2	1	1
Don't know/Won't say	2	1	2	1	2
Total respondents	(272)	(245)	(274)	(331)	(1,120)

***Text of question:** "Overall, has it been very easy, easy, difficult, or very difficult to understand your Stewardship Plan?"

Another evaluative question that came early in the questionnaire dealt with perceptions of the ease of doing the paper work required of participants in the FSP. Across the four regions only 7% to 14% of the respondents found such work to be "difficult" or "very difficult" (Table 5.2). Nineteen percent (in the Pacific States) to 25% (in both the Southern and Northern regions) assessed it to be "very easy," while 58% to 63% considered it "easy." Perhaps some streamlining or other simplification would improve these percentages. However, our regression analysis found no significant relationships between differences in perceptions of this aspect of the FS Program and any of the four dimensions of managerial behavior that we are considering in this chapter (starting to implement the FS plan, spending considerable amounts of one's own money on carrying out the plan, starting to apply a multi-purpose approach to managing the land, or beginning to use new practices). [32]

Table 5.2. Among the surveyed owners with active plans, their perceptions of the ease of doing the paper work required of participants in the Forest Stewardship Program. By region*					
Response Option	**Pacific States %**	**Mountains and Plains States %**	**Southern States %**	**Northern States %**	**Weighted National Sample %**
Very easy	19	23	25	25	25
Easy	59	63	58	60	60
Difficult	10	5	8	10	8
Very difficult	4	2	2	1	1
Don't know/Won't say	8	7	7	4	6
Total respondents	(272)	(245)	(274)	(331)	(1,120)

***Text of question:** "Overall, has it been very easy, easy, difficult or very difficult to do the required paper work involved with participating in the Forest Stewardship Program?"

Willingness to Recommend Program Participation to Friends and Family Members

[32] For these regression analyses we divided the sample into two groups: (1) the approximately 25% of the respondents who found the paper work "very easy" and (2) all others.

Chapter 5: Policy Inferences

Regression analysis did find statistically significant relationships between willingness to recommend program participation to friends or family and three of the four positive managerial behaviors. Across the four regions from 63% of the surveyed owners with active plans (in the Pacific States) to 67% (in both the Mountains/Plains states and the Northern region) said they would "strongly" recommend the program, while only 2% to 5% reported that they would "not recommend at all" (Table 5.3). A bar chart (Figure 5.1) demonstrates the consistently high percentage of respondents in all regions who answered that they would "strongly" endorse participation.

Compared to other respondents, the strong recommenders were estimated by regression analysis:

- to have been 1.8 times more likely[33] to have started to implement their plans (Appendix 2b),
- to have spent on average $467 more of their own money in implementing their (Appendix 1), and
- to be twice as likely (by a factor of 1.977) to have begun applying a multi-purpose approach to managing their land (Appendix Table 3b).[34]

Table 5.3. Among the surveyed owners with active plans, their willingness to recommend participation in the Forest Stewardship Program to friends or family members. By region*

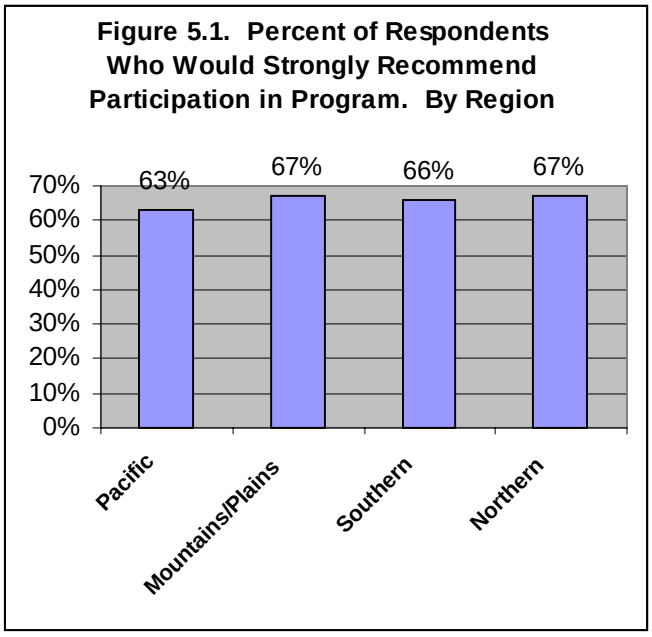
Response Option	Pacific States %	Mountains and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Recommend strongly	63	67	66	67	66
Recommend	30	28	27	29	28
Not recommend at all	5	2	5	3	4
Don't know/Won't say	2	3	2	1	2
Total respondents	(272)	(245)	(274)	(331)	(1,120)

***Text of question:** "Would you recommend to friends or family members that they participate in the Forest Stewardship Program if they had land suitable for it? Would you recommend it strongly, recommend it, or not recommend it at all?"

Willingness to recommend the program is probably not a direct cause of applying recommended practices, but rather the consequence of being satisfied with the application's effects. However,

33 "More likely" is defined as there being a greater likelihood or odds that the indicated type of respondent (e.g., recipient of technical assistance) was in the indicated outcome category (e.g., having started to implement FSP plans). In this case, logistic regression estimated that the odds of being an owner who had begun to carry out his/her plan increased by a factor of about 3.0 when respondents were either cost-sharing or technical-assistance recipients rather than non-recipients, other variables in the equation held constant.

34 That is, they reported having started to use practices recommended for at least two separate management purposes.



the satisfaction underlying the recommendation could lead to higher levels of plan implementation. In a separate logistic regression analysis designed to understand responses about recommending the program, we found that respondents were more likely to be strong recommenders if they had begun to apply wildlife-habitat or water-quality practices. More likely to be in this group also were respondents who had found their plans "very easy" to understand, the quality of follow-up technical assistance to be "highly useful," and had written their own plans, among other conditions (Table 7 of the Appendix). Receipt of cost sharing did *not* make them more likely to recommend strongly.

Relationship between Having Written One's Own Forest Stewardship Plan and Measures of Plan Implementation

About a quarter of the surveyed owners in the Pacific States' sample and 18% of the Mountains/Plains States' sample wrote their own plans (Table 5.4). In the other two regions the corresponding percentages were 3% in the South and almost 9% in the North. The process whereby private owners developed their own plans has been called "coached planning." Theo and Bergstrom's study of the process in two counties of the State of Washington found that, compared to forestland owners whose plans had been written for them, the owner-authors were more likely to feel "strongly" that they understood their plans. And "89% of the coached workshop respondents agreed or strongly agreed" that the "workshops made implementation of the forest stewardship plans more likely" (p. 381). In our national survey, landowner authorship of the plans was associated with spending more of the respondents' own money on plan implementation. Regression analysis estimated the average difference to be $1,313, other hypothesized causal variables held constant (Appendix Table 1). This sum is significant in a

practical sense when it is recalled that our weighted national sample with active plans spent on average $2,764 of their own money (see Table 3.15 in Chapter 3).

However, coached-planners were not any more likely to have reported the other three types of positive managerial responses to the FSP that this chapter emphasizes: starting to implement plans, following a multi-purpose approach to managing their land, or applying new practices. We looked for other potentially useful consequences of writing one's own FS plan and found only one. Compared to other surveyed owners, self-authors had a higher likelihood of being willing to recommend program participation strongly to friends or family (Appendix Table 7).

Table 5.4. Percentages of currently participating owners who wrote their own plans or who received plans written by others. By region*

Type of Author	Pacific States %	Mountain and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Owner, himself or herself	27	18	3	9	9
Someone in a public agency	41	72	70	68	67
Someone from a private firm	26	56	23	18	20
Someone else	2	2	2	1	2
Don't know or won't say	4	2	2	4	2
Total respondents with active plans	(272)	(245)	(274)	(331)	(1,120)

***Text of relevant questions:** "Now I need to ask you a few questions about how your Forest Stewardship Plan was developed. Did someone write the plan for you, or did you write the plan yourself after perhaps getting some instruction?
1. Someone wrote the plan for you
2. You wrote it, yourself
*If the response to this question was, "*Someone wrote the plan for you*," the follow-up question was "*"Who was the person who wrote the plan for you?
1. Someone from a *public agency* such as your state university extension service, forestry department, wildlife agency, or conservation district
2. Someone from a *private* consulting firm or forest products firms, or
3. Someone else?"

However, the self-authors were divided in their opinions of the value of writing their own plans. They were asked, "Would you recommend to family or friends that they write their own plans, or that they have the plans written for them by a specialist in managing forest land"? As Table 5.5 shows, only 37% of this group of respondents in the Pacific States recommended that others write their own plans. By contrast, more than two thirds of the self-authors in the Mountains/Plains States were positive about that role. The number of cases in the Southern

States was too small for comparisons; but in the Northern States less than a majority, 46%, would urge family or friends to write their own plans.

Table 5.5. Among the surveyed owners who wrote their own Forest Stewardship Plans, the percentage who recommended self-authorship or that a specialist write the plans. By region*

Response Options	Pacific States %	Mountains and Plains States %	Southern States %	Northern States %
Recommend that friends or family members write own plans.	37	68	11	46
Have a specialist write it for them	42	21	56	43
Don't know	14	9	33	7
Won't say	7	2	0	4
Total respondents who had plans written for them	(70)	(44)	(9)	(28)

***Text of question:** "Would you recommend to family or friends that they write their own plans, or that they have the plans written for them by a specialist in managing forest land"?

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Assessment of the Quality of Follow-up Technical Assistance

Across the four regions from 55% of the surveyed owners with active plans in the Pacific States to 67% in the Mountains/Plains States reported that they had received "follow-up technical assistance in the sense of some specialist in forest management having visited your land after the Stewardship Plan was approved to give you advice on how to carry out your Plan's recommendations" (Table 5.6). In all regions the most frequently cited source of such aid was a

Table 5.6. Among the surveyed owners with active plans, their reports about receiving follow-up technical assistance. By region*

Response Option	Pacific States %	Mountains and Plains States %	Southern States %	Northern States %	Weighted National Sample %
Yes	55	67	56	66	62
No	43	28	42	33	37
Don't know/Won't say	2	2	2	1	1
Total respondents with active plans	(272)	(245)	(274)	(331)	(1,120)
Source of Aid					
Public Agency	71	91	72	77	76
Public and Private	13	4	16	11	12
Private Agency	15	4	11	12	11
Don't know/Won't answer	1	1	1	0	1
Total recipients of follow-up technical assistance	(150)	(165)	(154)	(218)	(1,120)

***Text of question:** "Have you received follow-up technical assistance in the sense of some specialist in forest management having visited your land after the Stewardship Plan was approved to give you advice on how to carry out your Plan's recommendations?"

public agency. From 71% of the recipients in the Pacific States sample to 91% in the Mountains/Plains States said that the sole source was a public agency, while from 4% to 16% mentioned a combination of public and private (Table 5.6). Only 4% to 15% cited a private agency as the sole source.

In two related questions we asked the technical assistance recipients to classify the particular type of public or private specialist who visited their land: "private consultant, a representative of a forest products firm like a logging or processing firm, . . . a state agency like university extension or your state forestry or wildlife department, a federal agency like the U.S. Forest Service or the Natural Resources Conservation Service. . . ." The great majority of clients of *public* agencies--71% to 90%--reported "a state agency" as the specialists' affiliation (data line 1 of Table 5.7). Only 7% (in the Northern States) to 20% (in the Pacific and Mountains/Plains States) gave a federal source (line 2). "Consultants" were the most frequently cited *private* specialists, mentioned by 62% to 77% of the recipients of technical aid from private agencies (line 6). The highest percentage for representatives of forest products firms--24%--was recorded among respondents in the Southern States (line 7).

From the responses to this set of questions, we conclude state agency specialists played the dominant role in providing follow-up technical assistance. Across the four regions they were cited by 60% (Pacific States) to 79% (Northern States) of the total recipients of this kind of assistance (data line 11 of Table 5.7).[35] This contribution was in addition to the major role that state agencies played in developing the original technical assistance embodied in the written plans.

[35]Table 5.7's total numbers of recipients of technical aid, as indicated in line 12 of that table, is less than the sum of recipients of aid from public and private sources (lines 5 and 10) because some respondents reported assistance from both types of agencies.

Table 5.7. Among the surveyed owners who received follow-up technical assistance, the types of public and private sources of that assistance. By region				
Response Options	**Pacific States** %	**Mountains and Plains States** %	**Southern States** %	**Northern States** %
Public Sources of Aid				
1. State agency*	71	75	80	90
2. Federal agency**	20	20	14	7
3. Other public agency	3	2	2	2
4. Don't know/Won't say	5	3	4	1
5. Total recipients of aid from public sources	(127)	(157)	(136)	(192)
Private Sources of Aid				
6. Private consultant	71	77	71	62
7. Representative of a forest products firm***	5	23	24	20
8. Other private agency	19	0	3	14
9. Don't know/Won't answer	5	0	2	4
10. Total recipients of aid from private sources	(42)	(13)	(40)	(50)
Summary Role of State Agencies				
11. % of all aid recipients citing a state agency specialist as the sole source or one of two types of sources	60	72	71	79
12. Total recipients of aid from both public and private sources****	(150)	(165)	(154)	(218)

*"like university extension of your state forestry or wildlife department."
**"a federal agency like the Natural Resources Conservation Service.
***"a representative of a forest products firm like a logging or processing firm."
****We should note that Table 5.7's total numbers of recipients of technical aid, as indicated in line 12 of that table, is less than the sum of recipients of aid from public and private sources (lines 5 and 10) because some respondents reported assistance from both types of agencies.

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Each recipient of follow-up assistance was asked to evaluate it, whatever the source: "Not at all useful, slightly useful, moderately useful, and highly useful." Across the four regions from 61% (in the Mountains/Plains States) to 69% (Northern States) of this type of respondent rated it "highly useful" (Table 5.8). Another 23% to 27% considered it "moderately useful," while only 4% to 11% classified the aid they received as "slightly useful" or "not useful at all." There does not seem to be much room for improvement in this component of the program.

Table 5.8. Among the surveyed owners who received follow-up technical assistance, their opinions of the usefulness of that aid. By region*				
Opinions of All Respondents	**Pacific States** %	**Mountains and Plains States** %	**Southern States** %	**Northern States** %
Not at all useful	1	4	1	1
Slightly useful	5	7	7	3
Moderately useful	27	27	23	26
Highly useful	67	61	68	69
Don't know/Won't say	0	1	1	1
Total recipients of follow-up technical assistance	(150)	(165)	(154)	(218)

***Text of question:** "Overall, how would you rate the quality of the follow-up technical assistance you received? Was it not at all useful, slightly useful, moderately useful, or highly useful

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These evaluations varied somewhat by the source of the follow-up assistance. Among the surveyed owners who named public agencies as the source, the state agencies earned larger percentages of "highly useful" evaluations in all four regions, compared to federal sources (data lines 1 and 2 of Table 5.9). However, the differences in two regions, Mountains/Plains and Northern, were limited to one and six percentage points, respectively. They were greater in the Pacific and Southern States, 16- and 14-percentage points, respectively; but only the former difference was statistically significant.[36] The numbers of respondents who named representatives of forest products firms were too few to make an assessment of the quality of that source of follow-up technical assistance (line 4). In three regions (excepting the Mountains/Plains states), the owners mentioning "private consultants" were much more numerous and generally very positive (line 3).

Table 5.9. Among the surveyed owners who received follow-up technical assistance, the percentage who rated that aid to be "highly useful." By source of aid and by region*				
Opinions of Respondents	**Pacific States** %	**Mountains and Plains States** %	**Southern States** %	**Northern States** %
1. State agency representative**	68 (90)	62 (118)	72 (109)	70 (172)
2. Federal agency representative**	52 (25)	61 (31)	58 (19)	64 (14)
3. Private consultant**	80 (30)	70 (10)	57 (30)	58 (31)
4. Representative of a forest products firm**	100 (2)	100 (3)	60 (10)	50 (10)

***Text of question:** "Overall, how would you rate the quality of the follow-up technical assistance you received? Was it not at all useful, slightly useful, moderately useful, or highly useful?"

**In parentheses are the total number of responses on which the percentages are based.

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[36] At the 0.1 level in an independent samples *t* test.

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As with the four other types of client attitudes towards the Forest Stewardship Program discussed in this chapter, we used regression analysis to determine if owners' assessments of the quality of follow-up technical assistance was related to positive management behaviors. It was. Other things being equal,[37] the owners who rated their assistance "highly useful" were estimated:

- to be 2.9 times more likely to have started to carry out their FSP plans (Appendix Table 2a),
- to have spent $504 more of their own money on plan implementation (Appendix Table 1),
- to be 1.9 times as likely to have begun applying a multi-purpose approach to managing their forestland (i.e., to be using practices recommended for at least two separate managerial purposes—see Appendix Table 3a), and
- to be 1.3 times more likely to use a management practice that was new to them (Appendix Table 4a), compared to clients who did not receive any follow-up assistance or who did not evaluate it as "highly useful."

Therefore, among the total of five attitudes about the program that our survey measured, these evaluations of technical assistance were the most important by the criterion of being related to actual client behaviors. None of the other attitudes was associated with all four types of behaviors under consideration.

Importance of Cost-Sharing and Follow-up Technical Assistance

The federal budgets for both Fiscal Year 1999 and FY 2000 contained no appropriation for the Stewardship Incentives Program, the principal source of cost-sharing money for the FSP. Funding of technical assistance was to continue. According to our survey's findings, what might be the impact of much-reduced cost sharing assistance?

As discussed in Chapter 3, very few of the surveyed FS participants who had not started to implement their plans blamed their inaction on lack of money (Table 3.11). However, across the four regions, 47% to 64% of the respondents with active plans received cost sharing (data line 5 of Table 5.10). Of these groups of respondents, from 52% to 70% reported that they would not have "done as much" plan implementation without the cost-sharing they received (line 3 of Table 5.10). This subgroup amounts to 24% of the total respondents with active plans in the Pacific States, 34% in the Mountains/Plains States, 30% in the South, and 41% in the North (see data line 6 of Table 5.10). Figure 5.2 graphs these regional percentages.

The seven- to 17-percentage-point differences between the Northern States and the other three regions are all statistically significant.[38] The source of these differences is not simply that the Northern States' recipients of cost-sharing were relatively more numerous compared to all the other states; they ranked second in that respect after their counterparts in the Mountains/Plains States (data line 5 of Table 5.10). In addition, the Northern recipients reported themselves to be the most dependent on that kind of aid for the progress they had made (data line 3). Presumably, if federal cost sharing continues to be greatly reduced, sizable percentages of new FSP

[37] By "other things being equal," we mean that other hypothesized causal variables in the regression equation are held statistically constant.

[38] At the .1 level for the difference between Northern and Mountains/Plains States; lower for the other comparisons.

participants--perhaps as high as 41%--would not do as much with their plans.

Table 5.10. Respondents' assessments of effect of cost-sharing on plan implementation: Percentages selecting different response options by region				
Question: Would have done as much plan implementation if had *not* received the amount of cost-sharing received?	**Pacific States %**	**Mountain & Plains States %**	**Southern States %**	**Northern States %**
1. Yes	35	30	24	19
2. Maybe	11	14	13	8
3. *No*	52	53	60	70
4. Don't know or won't say	2	3	3	3
5. Number of respondents who received cost-sharing and those owners as a percentage of all respondents with active plans	(127) (47%)	(158) (64%)	(136) (50%)	(192) (58%)
6. Percentage of region's *total* respondents with active plans who answered "No"; they would not have done as much without cost-sharing*	24	34	30	41
7. Total respondents with active plans	(272)	(245)	(274)	(331)

*This percentage = the percent who answered "No" multiplied times the total recipients of cost-sharing divided by the total respondents with active plans.

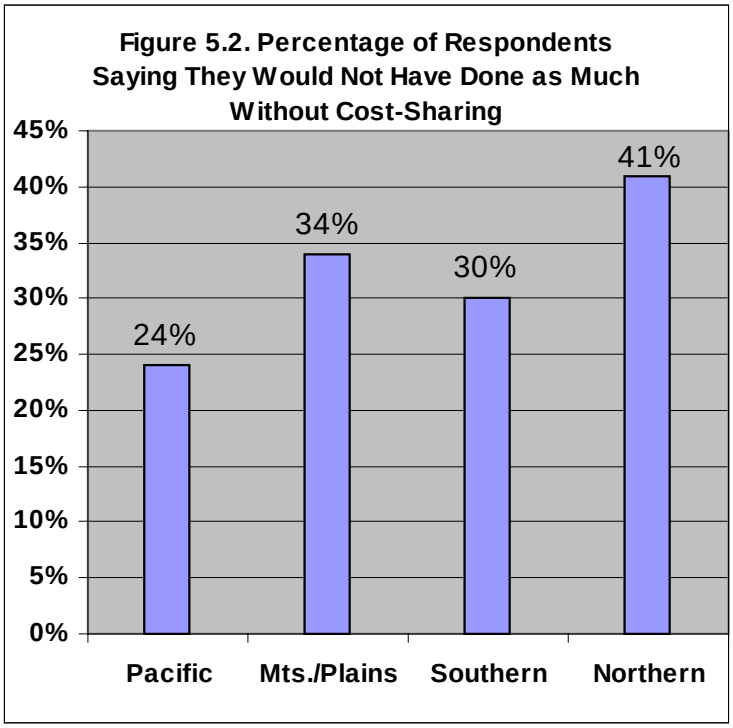

Table 5.11. Respondents' assessments of effect of follow-up technical assistance on plan implementation: Percentages selecting different response options by region				
Question: Would have done as much plan implementation if had *not* received the follow-up technical assistance?	**Pacific States %**	**Mountain & Plains States %**	**Southern States %**	**Northern States %**
1. Yes	34	20	22	27
2. Maybe	11	8	11	8
3. No	54	71	65	64
4. Don't know or won't say	1	1	2	1
5. Number of respondents who received technical aid and those owners as a percentage of all respondents with active plans	(166) (61%)	(158) (65%)	(133) (49%)	(185) (56%)
6. Percentage of region's total respondents with active plans who answered "No"; they would not have done as much without follow-up technical assistance*	33	46	32	36
7. Total respondents with active plans	(272)	(245)	(274)	(331)

*This percentage = the percent who answered "No" multiplied times the total recipients of follow-up technical assistance divided by the total respondents with active plans.

Follow-up technical assistance is of course another type of aid that is complementary to the help embodied in the Forest Stewardship Plans. Forty-nine percent to 65% of the respondents with active plans reported that they had received this type of aid (data line 5 of Table 5.11). Except in the Pacific region, these percentages for technical assistance recipients are very similar to those for cost-sharing (47% to 64%--Table 5.10). Also broadly alike are the percentages reporting that the extent of plan implementation they carried out was dependent on this kind of aid--technical. Across the four regions, from 32% of the total surveyed clients with active plans in the Southern States to 46% in the Mountains/Plains region said that they would not have done as much without the follow-up technical assistance (line 6 of Table 5.11), compared to 24% to 41% for cost-sharing (Table 5.10).

We used regression analysis to compare the impacts of follow-up technical assistance and cost-sharing on four types of client behavior. These two forms of assistance had similar estimated effects for two of the four measures. After taking into account other causal variables, including the other type of assistance (cost sharing or technical),

- The recipients of cost-sharing or of technical assistance were about three times more likely to have started to carry out their Forest Stewardship Plans compared to non-recipients (Table 2b in the Appendix).[39]

[39] "More likely" is defined as there being a greater likelihood or odds that the indicated type of respondent (e.g., recipient of technical assistance) was in the indicated outcome category (e.g., having started to implement FSP plans). In this case, logistic regression estimated that the odds of being an owner who had begun to carry out his/her plan increased by a factor of about 3.0 when they were either cost-sharing or technical assistance recipients rather than non-recipients, other variables in the equation held constant.

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- Cost-sharing recipients were 1.3 times more likely to have applied a management practice that was new to them, while 1.6 was the parallel factor among owners who received follow-up technical assistance (Appendix Table 4b).
- Cost-sharing participants spent on average an estimated $1,741 more on implementing their plans than did non-participants, while the receipt of technical assistance did not make a statistically significant difference in the level of such expenditure (Appendix Table 1).
- Conversely, technical assistance clients were two times more likely to have been applying practices recommended for at least two separate managerial purposes compared to a factor of 1.4 estimated for participants in cost-sharing (Appendix Table 3b).

These findings, along with those presented in tables 5.10 and 5.11 indicate that both cost-sharing and follow-up technical assistance significantly promote achievement of the goals of the Forest Stewardship Program. The loss of either kind of assistance is likely to diminish participants' efforts and therefore jeopardize the continuation of the program successes that were reported in chapters 3 and 4:

- *The implementation of plans*—we found that across the four regions 81% to 86% of all respondents had begun to carry out their FSP plans;
- *The leveraging of considerable, unreimbursed expenditures by owners for implementing plans*—we found that such expenditures averaged from $1,827 to $3,616;
- *Encouraging a multi-purpose approach to managing forestland*—across the regions from 55% to 68% of the surveyed participants were carrying out practices recommended for at least two separate management purposes rather than focusing on a single objective and thereby missing opportunities for achieving complementary goals;
- *Promoting innovation in management practices*—majorities of 52% to 56% of the respondents had begun to apply at least one practice that was new to them.

Finally, what does the survey indicate about "room for improvement" in administering the Forest Stewardship Program?

- African Americans seem to be under-represented in the program's clientele.
- In each of the four regions almost all surveyed clients (more than 90%) found their plans "easy" or "very easy" to understand.
- The same pattern of responses was found for participants' assessments of doing the paperwork the program requires.
- Sixty-three percent to 67% reported that they would "strongly recommend" the program to their friends or family members.
- In all regions majorities of the respondents received follow-up technical assistance, and 61% to 69% of those recipients found it to be "highly useful."
- Among the relatively small number of surveyed participants who reported writing their own plans, opinions were divided over recommending to others the same approach to developing FSP plans. Only in one of the four regions did a majority of this kind of program client recommend that friends and family members should follow their examples.

In sum, with this last exception, when program clients were given opportunities to evaluate the program, most chose to be positive. And most were implementing their plans appropriately.

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Appendix

Regression Analyses

Table 1. Explaining Variation in Responses about How Much Money Owners Spent on Implementing Their Plans that Was Not Expected to be Reimbursed

Dependent Variable*: Amount of money reported to have been spent, in hundreds of dollars*
Type of regression analysis: Ordinary Least Squares

Independent (Explanatory) Variables:	Constant and Independent Variables' Regression Coefficients	Significance Levels of Coefficients
Constant	-11.559	.112
Yes/no: Received cost sharing assistance.	17.409	.000
Yes/no: Believed follow-up technical assistance was "highly useful."	5.044	.048
Yes/no: Wrote plan himself/herself.	13.130	.000
Yes/no: A private firm wrote plan for owner.	14.990	.000
Yes/no: Found FSP plan "very easy" to understand.	-4.277	.096
1997 personal income in thousands of dollars	.230	.000
Months between receipt of plan and interview	.053	.596
Years that owned land under an FSP plan	.161	.060
Acres of land covered by FSP plan	.0094	.000
Yes/no: Would "strongly" recommend participation in Forest Stewardship Program.	4.670	.082
Number of respondents	(875)	
Adjusted R Square	.187	

A Note on Interpreting Logistic Regression Coefficients
The remaining tables in this appendix are based on logistic regression (Hosmer and Lemeshow 1989), which is a tool for determining associations between (a) a dichotomous outcome variable like the subject of tables 2a and 2b ("Yes/No: Respondent has started to implement at least one management activity recommended in his/her plan″) and (b) hypothesized independent (causal) variables, whether they be interval-level like age or dichotomous (e.g., "Yes/No: Respondent had received follow-up technical assistance").

Like ordinary-least squares multiple regression, logistic regression aims to estimate the unique effect on the dependent variable when there is a one-unit change in an independent variable. For example, in Table 2a, when we increment by one unit the variable, "Yes/No: Received cost-sharing assistance," by moving from the variable equaling zero (i.e., respondent did not receive such assistance) to the variable set at 1 (respondent did have such aid), logistic regression

calculates an estimated change in the log of the odds of the dependent variable equaling one, when any other hypothesized causal variables in the logistic regression equation are held statistically constant.

That predicted change is transformed from logarithmic form into a regular number, the latter being presented in the computer output as a coefficient called the "Odds Ratio." This ratio's values are found in the right-hand-most column of Table 2a. The odds ratio is the value with which we multiply the "base odds" in order to obtain the new odds of the dependent variable equaling one when there is a one-unit increase in the independent variable of interest and other independent variables are held constant. For example, we know from the discussion in Chapter 3 that 84% of the national weighted sample had begun to implement their plans. The odds of a randomly selected current participant in the FSP having started to carry out his/her plan would therefore be 84% divided by 16% or 5.25 to one.

If we wish to estimate the unique effect on those odds of 5.25 when participants receive cost-sharing, we multiply 5.25 by the "Odds Ratio" calculated for the cost-sharing variable, the value of 3.178 found in the right-hand-most column of Table 2a. The new odds become 16.685 to one (5.25 X 3.178). Given the array of potential explanatory variables in our survey instrument, this change in odds is our *best estimate* of the change attributable to cost-sharing. However, we are only moderately confident of this estimate, since the regression models' R square value is .247. This value means that our model explains about 25% of the variation in the log of the odds of the dependent variable having the value of 1.

Table 2a. Explaining Variation in Responses about Starting to Implement Owners' Forest Stewardship Plans

Dependent Variable: *Yes/No: Respondent has started to implement at least one management activity recommended in his/her plan*.
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	**The Constant and Independent Variables' Regression Coefficients and Their Significance Levels**	**Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value***
Constant	-2.040 (.005)	Not applicable
Yes/no: Received cost-sharing assistance	1.156 (.000)	3.178
Yes/no: Believed follow-up technical assistance was "highly useful."	1.052 (.002)	2.863
Owner's spending on implementing plan in hundreds of dollars	.018 (.003)	1.018
Yes/no: Would "strongly" recommend FSP	.556 (.027)	1.743
Months since plan was written	.037 (.000)	1.038
Yes/no: Live on land under a FSP plan at least one month per year	.718 (.004)	2.051
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	.633 (.048)	1.883
Number of respondents	975	
Nagelkerke R Square	.247	

*See note before Table 2a.

Table 2b. Explaining Variation in Responses about Starting to Implement Owners' Forest Stewardship Plan, with A Different Variable for Technical Assistance
Dependent Variable: *Yes/No: Have started to implement at least one management activity recommended in one's plan.*

Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and Their Significance Levels	Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-2.087 (.005)	Not applicable
Yes/no: Received cost-sharing assistance.	1.069 (.000)	2.914
Yes/no: Received follow-up technical assistance.	1.140 (.000)	3.127
Owner's spending on implementing plan in hundreds of dollars	.017 (.006)	1.017
Yes/no: Would strongly recommend FSP.	.613 (.015)	1.847
Months since plan was written	.035 (.001)	1.036
Yes/no: Live on land under a FSP plan at least one month per year.	.722 (.004)	2.058
Yes/no: Received technical assistance before plan.	.620 (.054)	1.858
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	975	
Nagelkerke R Square	.262	

*See note before Table 2a.

Table 3a. Explaining Variation in Responses about Starting to Implement Practices Recommended for Two or More Separate Management Purposes, i.e., Managing Land with a Multi-Purpose Approach

Dependent Variable: *Yes/No: Respondent has started to implement at least one practice recommended for two or more separate management purposes.*
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and Their Significance Levels	Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.525 (.000)	Not applicable
Yes/no: Received cost-sharing assistance.	.366 (.014)	1.442
Yes/no: Believed follow-up technical assistance was "highly useful."	.632 (.000)	1.882
Owner's spending on implementing plan in hundreds of dollars	.009 (.000)	1.009
Yes/no: Would "strongly" Recommend FSP.	.616 (.000)	1.852
Yes/no: Live on land under a FSP plan for at least one month per year.	.290 (.045)	1.337
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	.528 (.001)	1.696
Yes/no: Had a stream, pond, or other surface water on or near FSP land.	.446 (.004)	1.561
Ratio of forestland acres under an FSP plan to total forest land acres owned by respondent	.489 (.044)	1.631
Yes/no: Had received income from harvested timber in last two years.	.567 (.002)	1.764
Number of respondents	1,094	
Nagelkerke R Square	.184	

*See note before Table 2a.

Table 3b. Explaining Variation in Responses about Starting to Implement Practices Recommended for Two or More Separate Management Purposes, i.e., Starting to Manage Land with a Multi-Purpose Approach, with a Different Variable for Technical Assistance.

Dependent Variable: *Yes/No: Respondent has started to implement at least one practice recommended for two or more separate management purposes.*
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and Their Significance Levels	Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.727 (.000)	Not applicable
Yes/no: Received follow-up technical assistance.	.683 (.000)	1.979
Yes/no: Received cost-sharing assistance.	.313 (.038)	1.367
Ratio of forestland acres under an FSP plan to total forestland acres owned by respondent	.498 (.041)	1.646
Owner's spending on implementing plan in hundreds of dollars	.009 (.000)	1.009
Yes/no: Would "strongly" Recommend FSP	.682 (.000)	1.977
Yes/no: Live on land under a FSP plan for at least one month per year.	.286 (.049)	1.331
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	.534 (.001)	1.705
Yes/no: Had a stream, pond, or other surface water on or near FSP land.	.465 (.003)	1.592
Yes/no: Had received income from harvested timber in last two years.	.566 (.002)	1.760
Number of respondents	1,094	
Nagelkerke R Square	.1904	

*See note before Table 2a.

Table 4a. Explaining Variation in Responses about Whether Owner Had Started to Implement At Least One Activity that Was Recommended in His/Her Forest Stewardship Plan *and* that Was New to Him or Her

Dependent Variable: *Yes/No: Respondent has started to implement at least one management activity that was new.*

Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and Their Significance Levels	The Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.004 (.001)	Not applicable
Yes/no: Received cost-sharing assistance.	.346 (.019)	1.414
Yes/no: Believed follow-up technical assistance was "highly useful."	.244 (.099)	1.277
Yes/no: Found FSP plan "very easy" to understand.	-.301 (.042)	.740
Ratio of forestland acres under an FSP plan to total forestland acres owned by respondent	.506 (.034)	1.658
Acres of land covered by FSP plan	-.0003 (.041)	.9997
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	-.427 (.005)	.653
Years that owned land under plan.	-.010 (.032)	.990
Yes/no: Respondent was a male.	-.640 (.000)	.527
Yes/no: Had started to implement one or more recommended activities for planting/caring for trees.	1.319 (.000)	3.739
Yes/no: Had started to implement one or more recommended activities for harvesting/marketing trees.	.537 (.001)	1.711
Yes/no: Had started to implement one or more recommended activities to promote wildlife habitat.	.661 (.000)	1.937
Yes/no: Had started to implement one or more recommended activities to protect water quality.	.498 (.003)	1.645
Number of respondents	1,086	
Nagelkerke R Square	.222	

*See note before Table 2a.

Table 4b. Explaining Variation in Responses about Whether Owner Had Started to Implement At Least One Activity that Was Recommended in His/Her Forest Stewardship Plan *and* that Was New to Him or Her, With a Different Variable for Technical Assistance

Dependent Variable: *Yes/No: Respondent has started to implement at least one management activity that was new.*

Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and Their Significance Levels	The Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.082 (.001)	Not applicable
Yes/no: Received cost-sharing assistance.	.284 (.059)	1.329
Yes/no: Received follow-up technical assistance.	.486 (.001)	1.626
Yes/no: Found FSP plan "very easy" to understand.	-.289 (.052)	.749
Ratio of forestland acres under an FSP plan to total forestland acres owned by respondent	.502 (.036)	1.652
Acres of land covered by FSP plan	-.0003 (.031)	.9997
Yes/no: Private consultant wrote plan.	.418 (.024)	1.519
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	-.467 (.002)	.627
Years that owned land under plan.	-.014 (.005)	.986
Yes/no: Respondent was a male.	-.664 (.000)	.515
Yes/no: Respondent was retired.	.282 (.092)	1.326
Yes/no: Had started to implement recommended activities for planting/caring for trees.	1.250 (.000)	3.490
Yes/no: Had started to implement one or more recommended activities for harvesting/marketing trees.	.428 (.009)	1.533
Yes/no: Had started to implement one or more recommended activities to promote wildlife habitat.	.641 (.000)	1.898
Yes/no: Had started to implement one or more recommended activities to protect water quality.	.493 (.003)	1.637
Number of respondents	1,086	
Nagelkerke R Square	.231	

*See note before Table 2a.

Table 5. Explaining Variation in Responses about Whether Owner Had Begun to Plant Trees for the First Time

Dependent Variable: *Yes/No: Respondent reported that had begun to plant trees and that activity was new to him/her.*
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and Their Significance Levels	The Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.705 (.000)	Not applicable
Yes/no: Received follow-up technical assistance.	.277 (.051)	1.319
Years that owned land under plan	-.015 (.003)	.985
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	-.338 (.017)	.713
Yes/no: Respondent was a male.	-.338 (.040)	.7133
Yes/no: Respondent was retired.	.327 (.037)	1.386
Ratio of forestland acres under an FSP plan to total forestland acres owned by respondent	1.669 (.000)	5.308
Yes/no: Had started to implement one or more recommended activities for harvesting or marketing trees.	.812 (.000)	2.253
Number of respondents	1,109	
Nagelkerke R Square	.167	

*See note before Table 2a.

Table 6. Explaining Variation in Responses about Whether Owner Had Begun to Harvest Trees or Thin for the First Time

Dependent Variable: *Yes/No: Respondent reported that had begun to harvest or thin trees and that activity was new to him/her.*
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables:	**The Constant and Independent Variables' Regression Coefficients and Their Significance Levels**	**The Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value***
Constant	3.402 (.000)	Not applicable
Years that owned land under plan	-.011 (.055)	.989
Owner's spending on implementing plan in hundreds of dollars	-.004 (.058)	.996
Ratio of forestland acres under an FSP plan to total forestland acres owned by respondent	.718 (.017)	2.050
Yes/no: Had started to implement one or more recommended activities for planting or caring for trees.	1.284 (.000)	3.610
Yes/no: Had started to implement one or more recommended activities for harvesting or marketing trees.	1.570 (.000)	4.806
Yes/no: Had started to implement one or more recommended agroforestry practice.	-.603 (.013)	.547
Yes/no: Had a stream, pond, or other surface water on or near FSP land.	.505 (.011)	1.657
Number of respondents	1,087	
Nagelkerke R Square	.212	

*See note before Table 2a.

Table 7. Explaining Variation in Responses about Whether Owner Would "Strongly" Recommend Participation in the Forest Stewardship Program to Friends or Family Members

Dependent Variable: *Yes/No: Respondent would "strongly" recommend participation*
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and its Significance Level	The Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.231 (.015)	Not applicable
Yes/no: Found plan to be "very easy" to understand	1.052 (.000)	2.863
Yes/no: Believed follow-up technical assistance was "highly useful."	.754 (.000)	2.126
Yes/no: Wrote plan himself/herself.	.446 (.038)	1.561
Yes/no: Had received technical assistance for one's forest land before participated in FSP.	.695 (.000)	2.004
Yes/no: Now subscribes to a magazine or online service related to forestland management.	.345 (.018)	1.413
Yes/no: Respondent is a male.	-.457 (.013)	.633
Number of years of education completed	.062 (.037)	1.064
Yes/no: Had started to implement one or more recommended activities to promote wildlife habitat.	.266 (.069)	1.305
Yes/no: Had started to implement one or more recommended activities to protect water quality.	.283 (.095)	1.327
Number of respondents	1,096	
Nagelkerke R Square	.204	

*See note before Table 2a.

Table 8. Explaining Variation in Responses about Whether Owner Had Become a Subscriber to a Print or Electronic Information Source for Managing His/Her Forestland Only After Had Obtained a Forest Stewardship Plan

Dependent Variable: *Yes/No: Respondent had begun such a subscription only after had obtained his/her FSP.*
Type of regression analysis: *Logistic*

Independent (Explanatory) Variables	The Constant and Independent Variables' Regression Coefficients and its Significance Level	The Odds Ratio=The odds of a "yes" response are changed by being multiplied by this value*
Constant	-1.887 (.000)	Not applicable
Yes/no: Believed that cost-sharing was highly useful.	.362 (.049)	1.436
Owner's spending on plan implementation in hundreds of dollars	.005 (.004)	1.0048
Yes/no: Strongly Recommend FSP	.469 (.002)	1.599
Number of separate management purposes being actively pursued (scale of zero to 5)	.164 (.004)	1.179
Yes/no: Live on land under a FSP plan for at least one month per year	-.413 (.003)	.662
Age in years	.111 (.052)	1.118
Number of respondents	1,122	
Nagelkerke R Square	.063	

*See note before Table 2a.

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